RICAPS
Regionally Integrated Climate Action Planning Suite

City of Brisbane
Climate Action Plan

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LETTER FROM THE MAYOR, Terry O'Connell

Right now is a critical time for our community, our economy, and our environment. We are fortunate in Brisbane to be surrounded by a wealth of knowledge and opportunity, fostered by our businesses' innovation and emboldened by our residents' entrepreneurial spirit. Brisbane has a strong history of supporting environmental preservation principles, as exemplified by The Open Space Plan, Priority Conservation Area designation of San Bruno Mountain, and adoption of the Baylands Sustainability Framework. This drive to protect natural resources is one of the core values of our community. However, resources fundamental to the vibrancy of Brisbane are at risk from the effects of climate change which, in San Mateo County, threatens to increase sea level, summer temperatures, the prevalence and strength of storms, and air pollution; to aggravate health problems; and to decrease the reliability of the water supply.

Climate change is a global problem, and only through local solutions designed to meet the needs of our community can we mitigate and adapt to its impacts and protect the environment. Together, we can conserve our scarce resources, thereby saving our families and companies money, increasing the resilience of our economy and emergence of new markets that prioritize green technologies. This plan is a comprehensive and strategic approach to sustainability, offering a suite of recommended actions that will engage all members of Brisbane's community in this journey to safeguard our environment. The Plan also includes ideas to allow our City government to "walk the talk" by implementing practices that minimize our own impacts on the environment by echoing the energy efficiency, water conservation and alternative transportation programs and services our Climate Action Plan proposes to establish for our community.

This small but important step is just the beginning of an exciting time of environmental stewardship and community transformation in which the City of Brisbane is taking the lead. But, as you can see when reviewing this Plan, the proposed efforts of Brisbane are small when compared to the collective action of our citizenry. Sustainability requires more than just environmental protection; it will take leadership and partnership to deploy these actions. We invite you to actively join Brisbane's transition to a clean environment, healthy community, and prosperous future. The key to Brisbane's success is you!

Terry O'Connell, Mayor

Executive summary

The purpose of this Climate Action Plan is to reduce the GHG emissions for the City of Brisbane to comply with State Assembly Bill AB32. Brisbane believes in the importance in preserving natural resources, as is evident in the restoration work and acquisition of open space in the Brisbane Acres. It is pertinent that each city reduces their carbon footprint to aid in reducing the future impacts of increased global warming. At the time of the preparation of this document, Brisbane's first Climate Action Plan, new and increasing goals were adopted by the state to further reduce greenhouse gas emissions (GHGs). Thus, this document will be updated periodically to be compliant with new requirements and as resources become available for far reaching goals.

A municipal and community wide GHG inventory was completed for the City of Brisbane in 2005 and 2010. The baseline year for GHG emissions was chosen to be 2005, since AB32's goal for GHG reductions, to reach 1990 levels by year 2020, are generally agreed to be 15% below 2005 levels. GHG inventories are completed by consultants, in partnership and sponsored by City/County Association of Governments of San Mateo County, for Brisbane and encompassing cities. This data was used to create GHG reduction goals for City of Brisbane. Brisbane's reduction target for 2020 is a reduction of 13,876 $MTCO_2e$: local proposed measures, when implemented, will reduce GHG emissions by approximately 3,147 $MTCO_2e$ and state initiatives will lower GHG emissions by 12,867 $MTCO_2e$.

1 Introduction

By Glenn Fieldman, PhD

The City of Brisbane is pleased to present the following Climate Action Plan. This Plan is designed to be a blueprint of our community's response to the challenges posed by climate change. Climate scientists around the world, represented by the Intergovernmental Panel on Climate Change, are unequivocal: human activity is changing the earth's climate through the release of greenhouse gas (GHG) emissions resulting primarily from the combustion of fossil fuels. The longer communities delay taking action, the greater the risk humans face of irreversibly destabilizing the climate and harming our environment. If we delay any longer, that useful policy and programs will become infeasible and both human civilization and the biosphere will be permanently damaged.

Our city cannot solve the climate crisis alone. Together with our partners in county, state, and federal government, Brisbane has committed to taking steps to reduce our emissions and to create new programs and services that will support our community and our families in doing the same. This Plan offers ways to make our homes more energy efficient and increase the amount

of locally produced renewable energy. It suggests improvements to infrastructure and transit that allow people to go about their business on foot, by bicycle, or via public transportation, and offers ways to reduce the waste heading to our landfills. Finally, this Plan outlines measures that will make our municipal government a more efficient and resource-conservation minded organization.

"Hell and high water" aptly describes what 194 nations, including the United States, pledged to avoid when they signed and ratified the United Nations Framework Convention on Climate Change back in 1992. Even then, the hypothesis that human activities like fossil fuel burning and deforestation were warming the climate was supported by a mountain of evidence that was persuasive to most of the scientific community. The Convention committed the signatories to "avoid dangerous (anthropogenic—that is, human caused) interference with the climate system"—but it did not specify exactly what should be done, nor commit any of the signatories to emissions reductions limits. It was not until 2005 that specific (but modest) emissions reduction targets for developed nations were decided and included in the Kyoto Protocol. Although the Protocol came into effect, the refusal of the United States to ratify the agreement limited its effectiveness.

In the succeeding years, the scientific evidence has become ever more persuasive. Contending explanations for the observed and measured rise in global temperatures, such as an increase in the energy emitted by the sun, have been tested and ruled out: the vast majority of climate scientists now agree that human emissions of the major anthropogenic "greenhouse gases"--carbon dioxide, methane, and a couple of others—are trapping heat that would otherwise escape from earth into space. The case for strong policy action has become overwhelming: scientists and governments alike agreed in 2009 in Copenhagen that the goal of policy action should be to limit the temperature increase to two degrees Celsius—a "threshold" beyond which the disruptions to agriculture, ecosystems, and organized human life are likely to be intolerable.[1] Meanwhile, the greenhouse gases that we have dumped into the atmosphere since the Industrial Revolution (circa 1750) have caused temperatures to rise inexorably, more quickly in recent years. NASA's Earth Observatory reports that global average temperatures are now .8° C (1.4° Fahrenheit) warmer than they were before the Industrial Revolution.[2] As a result, we are already seeing "hell and high water" and are barreling very quickly toward much worse. On our present course, we will likely increase greenhouse gas concentrations in the atmosphere

[1] Many scientists fear that even 2◦C is too risky, and want policy ambitious enough to limit temperature rises to 1.5◦C. See for example "Temperature limit too high to avoid climate change," (Reuters, 12/4/13). http://www.reuters.com/article/2013/12/04/us-climate-temperature-idUSBRE9B218020131204

[2] See http://earthobservatory.nasa.gov/Features/WorldOfChange/decadaltemp.php for an interactive graphic illustrating the temperature increases up to the present by decade.

enough to blow past the 2° C ceiling by 2050—and perhaps, according to climate expert Michael Mann, as soon as 2036.[3]

Unfortunately, the policy "brakes" on emissions are not being applied with anywhere near the pressure the climate situation demands. That's especially true for the United States, which lacks a comprehensive federal climate policy even though the U.S. is the world's largest c*umulative* emitter of carbon dioxide, the main greenhouse gas. The U.S. therefore has a disproportionate impact on the global climate and a considerable share of the responsibility for the climate burden carried by countries like the Philippines, which as a poor country has emitted very little carbon.[4] [5] U.S. actions (or inactions) are important not only in and of themselves, but because what we do as a self-proclaimed world leader serves as an example to (or an excuse for) other countries, including high emitters like China and India. President Obama has taken important executive actions to reduce carbon emissions and has achieved a voluntary agreement with China. But Congress, under the influence of the powerful fossil fuel and other carbon-intensive industries, can still obstruct or undermine these actions, and polluters have launched an offensive against the President's Clean Power Plan, which is intended to reduce power plant emissions, in the courts.

http://www.cubehouse.ca/images/globe_hand_175h.jpg

U.S. cities and states have moved forward on their own (although help in the form of incentives and funding from the federal government are still essential if we are to meet the rigorous emissions-reductions targets that are necessary to stabilize the climate and minimize the damage). Californians have been among the first to step up to the plate. In 2006, the California state legislature made history by adopting AB 32, the Global Warming Solutions Act, which committed the world's 8th largest economy (2013 ranking) to shrinking its climate-

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[3] Mann's piece in Scientific American is online here: http://www.scientificamerican.com/article/earth-will-cross-the-climate-danger-threshold-by-2036/

[4] Philippines climate envoy Yeb Sano's emotional speech at the 2013 international climate summit in Warsaw is essential viewing: https://www.youtube.com/watch?v=7SSXLIZkM3E

[5] Cumulative (historical) emissions) count, because carbon dioxide stays in the atmosphere for as long as hundreds of years. The U.S. has been emitting a large quantity of carbon dioxide since it became an industrial superpower and an "automobile nation" early in the 20th century. The carbon dioxide Americans emitted then is helping to warm the atmosphere now.

changing carbon emissions to 1990 levels by the year 2020, a 15% reduction from "business as usual". In April of 2015, California Governor Jerry Brown increased the ambition of these efforts by executive order, announcing a state emissions-reduction goal of 40% below 1990 levels by 2030. As the world's 12th largest emitter of the atmospheric carbon that has already measurably affected both global and local climates, California has a special responsibility to act. AB 32, enhanced by Brown's executive order, is a down payment, and a substantial one. As it creates the policies and measures necessary to achieve the law's emissions reduction goals, California will act as a laboratory, setting examples that may smooth the path of other states and regions.

The California Air Resources Board (CARB), the implementing agency for AB 32, recognizes that cities like Brisbane have been ahead of the curve with green building ordinances, retrofits, and improvements in municipal practices. The CARB calls local governments "essential partners" in the effort to roll out AB 32, and asks local governments to develop Climate Action Plans to reduce carbon emissions from their own operations and those of business and residents within the framework provided by the law. We are pleased to introduce Brisbane's Climate Action Plan—a cooperative effort involving Brisbane City staff, consultant DNV-GL (provided by San Mateo City/County Association of Governments) and citizen volunteer members of the Open Space and Ecology Committee, with funding assistance from the Bay Area Air Quality Management District (BAAQMD and Pacific Gas and Electric Company. The plan is intended to

***demonstrate environmental leadership—**to show that Brisbane as a community can rise to the challenge of climate change by taking reasonable steps to reduce our GHG emissions;

***help Brisbane residents save money and contribute to the creation of green jobs:** increased energy and water efficiency can lower utility bills for residents, businesses, and government. Significant deployment of efficiency measures and renewable energy installations will increase the demand for workers skilled in these areas.

***reaffirm Brisbane's role as a partner in the statewide effort to reduce GHGs.**

Climate emergency: hell and high water

Humans, especially those of us who live in wealthier countries, are pouring vast quantities of heat-trapping gases, known as greenhouse gases (GHGs), into the atmosphere at increasing

rates.[6] These GHGs, produced by fossil fuel extraction and burning, deforestation and land use changes, factory farming and landfilling of organic materials, trap heat that would otherwise be reflected away from the earth and into space.

The scientific community is nearly unanimous in agreement that our greenhouse gas emissions have warmed the global average temperature of the Earth by .85° C, or close to one and one-half degrees F, above pre-industrial temperatures. This apparently small increase has resulted in dramatic changes: rapid ice melt in the Arctic, Greenland, West Antarctica and glaciated regions worldwide[7]; sea level rise that has already led to chronic flooding in places from Norfolk, VA to Bangladesh; lethal, crop-killing summer heat waves on all continents,[8] longer, fiercer fire seasons, and extreme weather including drought, hurricanes and "extreme precipitation events," all of which present direct threats to people's lives and livelihoods.

http://www.themonitordaily.com/rising-temperatures-may-lead-to-a-20-foot-sea-level-rise/23753/

Other climate-driven changes may have less immediate and dramatic effects on humans, but are likely to be just as significant for the human future, since we depend on well-functioning ecosystems and the goods and services they provide. Warming oceans are "bleaching" and eventually killing the corals that build reefs, the most productive ecosystems in the oceans. Closer to shore, when combined with nitrogen-rich runoff (that is, water contaminated with synthetic fertilizer or human or animal waste), the warming of surface waters encourages vast algae blooms, which may be themselves poisonous[9]--and which, when they die, remove the oxygen from the water, causing "dead zones" that cannot support marine life. An enormous

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[6] Global carbon dioxide (CO_2) emissions amounted to 36 billion tons in 2010. They are increasing at about 2.5% per year (www.co2now.org). Methane is an even more powerful GHG—up to 80 times more--than CO_2. Annual global methane emissions are approximately 450-500 teragrams; a teragram is about 1.1 million tons.

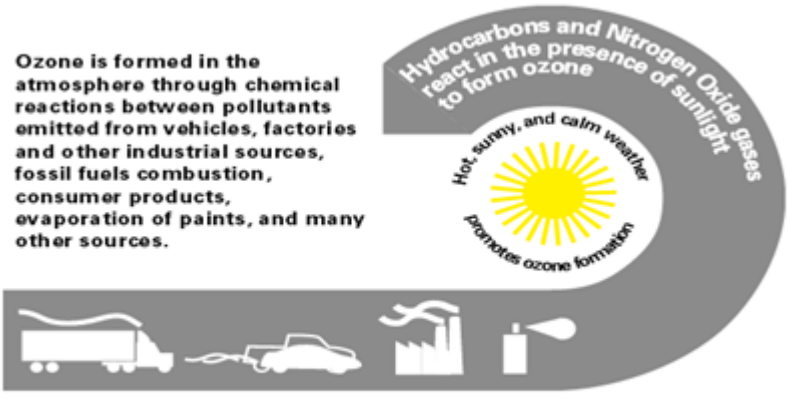
[7] See Extreme Ice Survey (www.extremeicesurvey.org), *National Geographic's* photoessay "The Big Thaw" (June 2007, http://ngm.nationalgeographic.com/2007/06/big-thaw/big-thaw-text); "Greenland and Antarctic melting at "unprecedented rate," (Climate News Network September 2014, at http://www.rtcc.org/2014/09/01/greenland-and-antarctic-melting-at-unprecedented-rate/).

[8] European heat waves in 2003 and 2010 killed tens of thousands of people each. No particular event like this can be directly attributed to anthropogenic global warming, but rising average temperatures do make heat spikes more likely, according to climate researchers: increasing average temperatures is like loading the dice. See "European heat wave was warmest in 500 years," NBC Science, March 17, 2011, http://www.nbcnews.com/id/42139347/ns/technology_and_science-science/t/european-heat-wave-was-warmest-years/#.VLcXZXvo4c0.

[9] See "Driven by Climate Change, Algae Blooms Behind Ohio Water Scare are New Normal," in *National Geographic News* (August 4, 2014, http://news.nationalgeographic.com/news/2014/08/140804-harmful-algal-bloom-lake-erie-climate-change-science/).

bloom of toxic algae along the entire Pacific coast of North America which was first spotted in May 2015 had by August forced the closure of a long section of the Washington coast to crab fishing, as the toxin from the algae worked its way through the food web.[10] Terrestrial ecosystems, too, are reeling from temperature changes that have altered the habitats of many species, as well as the timing of biological processes. Some caterpillars, for instance, no longer hatch in sync with the arrival of migratory birds, which consequently lack food for rearing their young. A 2014 Audubon Society study of 588 North American bird species found that 314 of them would be "climate-threatened" or "climate-endangered" by the end of the century.[11] Pests such as pine beetles are multiplying because mild winters allow them to breed all year, killing millions of acres of forest in the Western U.S. and Canada, while midwinter mild spells followed by a return to normal winter temperatures are devastating crops such as cherries.[12]

Californians up and down our state have firsthand experience with unpleasant climate-induced changes, most notably the current historic drought that has left withered landscaping, empty reservoirs and several Central Valley towns without drinking water. The fire "season" in California now often lasts the whole year. Even in normal years, though, warmer winters are diminishing snowpack, a natural water storage system that will have to be replaced by other kinds of storage, with its associated costs. A 2013 report issued by the California EPA says starkly that "climate change poses an immediate and growing threat to California's environment, public health and economic vitality,"[13] with agriculture most obviously at risk.


Ozone is formed in the atmosphere through chemical reactions between pollutants emitted from vehicles, factories and other industrial sources, fossil fuels combustion, consumer products, evaporation of paints, and many other sources.
Hydrocarbons and Nitrogen Oxide gases react in the presence of sunlight to form ozone
Hot, sunny, and calm weather promotes ozone formation
http://www.arb.ca.gov/research/aaqs/caaqs/ozone/ozone-fs.pdf

Climate changes pose significant health risks to Californians. While the ocean and bay usually moderate temperatures in our region, extreme heat events have affected the Bay Area in the past and are likely to become more frequent in the future, with outdoor workers, the elderly and infants particularly vulnerable. Air conditioning is less common in the Bay Area than it is elsewhere in California.

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[10] See CBS News, August 5, 2015, http://www.cbsnews.com/news/toxic-algae-bloom-in-pacific-even-larger-than-thought/

[11] See www.climate.audobon.org.

[12] http://glenarborsun.com/will-climate-change-kill-the-michigan-cherry/

[13] Office of Health Hazard Assessment, California Environmental Protection Agency. Links to the summary and full report are available here: http://oehha.ca.gov/multimedia/epic/2013EnvIndicatorReport.html

High temperatures and dry conditions produce higher levels of ozone, which can exacerbate respiratory illnesses, particularly among vulnerable populations. Ozone and smog already contribute to 19,000 premature deaths, 9400 hospital admissions, 22,000 cases of acute bronchitis, and millions of lost school- and workdays, according to the Air Resources Board and the American Lung Association.[14] Smoke from fires can also cause respiratory and cardiovascular problems.

As a coastal state, California is vulnerable to sea level rise, and the heavily developed Bay Area with its dense population living in close proximity to the shoreline is especially so. For most of the 20th century, sea levels rose at about 1.7 mm per year—but in the last two decades of the 20th century and subsequently, sea level rise has accelerated to 3.1 mm per year because of melting terrestrial ice and because water expands as it warms. A recent study bearing the imprimatur of the nation's major scientific bodies projects that; taking into account likely further acceleration, sea levels in Central California will rise between 2 and 12 inches in less than two decades, by 2030. By this century's end, the same report projects 17 inches of sea level rise at the conservative end—but as much as 66 inches (5 ½ feet) if we are not so lucky.[15] [16] [17] A 2009 report from the Pacific Research Institute estimates that almost half a million people and $100 billion in coastal property are at risk with 1.4 meters of sea level rise, which is at the more conservative end of the range of possibilities. County infrastructure and facilities at risk from a 100-year flood event with 1.4 meters sea level rise include:

*24 billion (replacement value) of buildings/contents, mostly along the Bay
*530 miles of roadway
*10 miles of railroad
*San Francisco Airport and the 31 megawatt United Cogen Power Plant located there
*Wastewater treatment plants with a total treatment capacity of 44 million gallons per day, operated by South SF/San Bruno, Millbrae, San Mateo, South Bayside System Authority, Mid-Coastside Sewer Authority, and SFO
*78 EPA-regulated hazardous materials sites
*34 square miles of coastal wetlands.[18] [19]

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[14] American Lung Association. "Land Use, Climate Change & Public Health Issue Brief: Improving public health and combating climate change through sustainable land use and transportation planning. Spring 2010.

[15] Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, Future. http://www.ecy.wa.gov/climatechange/docs/ipa_slr_nrcbrief.pdf

[16] Sea level rise maps can be viewed here: http://geology.com/sea-level-rise/san-francisco.shtml and here http://www.bcdc.ca.gov/slr.shtml

[17] The sea level rise "wild card" has to do with how rapidly large ice sheets, such as those covering Greenland, melt. Predictions vary widely.

[18] Heberger et al, 2009 (Pacific Institute). The Impacts of Sea Level Rise on the California Coast, downloadable here http://pacinst.org/publication/the-impacts-of-sea-level-rise-on-the-california-coast/. Links to interactive sea level rise maps are also available on this page.

Projected Sea Level Rise - San Mateo County Shoreline[1]

[19] A recent report principally authored by renowned climate scientist James Hansen suggests that we could be on track for multiple meters of sea level rise within a much shorter time frame than has been predicted, and that even 2˚C could lock in melting of large ice sheets. See http://thinkprogress.org/climate/2015/07/27/3684564/james-hansen-climate-danger-hyper-anthropocene/. A link to the paper by Hansen et. al is included in the article.

Visible, adverse changes have been brought about by a mere 1.5˚ F temperature increase. If we do not act promptly and urgently to reduce all sources of greenhouse gas emissions, much worse is in store. The Intergovernmental Panel on Climate Change (IPCC), which is charged with evaluating and summarizing for policymakers thousands of peer-reviewed climate change research studies, recently issued its Fifth Assessment Report. If we continue emitting carbon dioxide, methane and other greenhouse gases on our present trajectory, the IPCC estimates temperature increases by the end of the century will be from about 3 to as much as 6.5◦ Celsius, or between about 5 and 11◦F. Positive climate feedbacks, in which the consequences of warming lead to even more warming, could drive temperatures to the higher end of that range. The most worrisome feedback scenario concerns methane frozen in Arctic soils and seabeds. Methane is a powerful greenhouse gas. A molecule of methane is less persistent in the atmosphere than carbon dioxide, but can trap up to 86 times more heat next to the earth than a molecule of carbon dioxide[20]]. The possibility of large-scale Arctic methane releases as the permafrost melts are therefore extremely worrisome, since they could potentially drive global temperatures up very quickly[21]. Abrupt, non-linear changes like this could throw the climate into a self-perpetuating warming trajectory that is beyond any human control.

Climate change will interact with many other social and environmental stressors to produce impacts that are much larger than those of climate change alone. For instance, it's the combination of warm(er) water and agricultural runoff that leads to massive algal blooms and 'dead zones,' while hotter temperatures are magnified by urban hardscapes (the urban 'heat island effect')—a magnification that may be fatal: A European heat wave in 2003, of the sort that will become more likely as global average temperatures rise, killed thousands, almost all of them in cities. Finally, climate change and its consequences overlay a global political system that is profoundly unequal, and is therefore likely to cause or exacerbate both domestic and international conflicts. For instance, a severe drought exacerbated by climate change has been implicated in the Syrian civil war, which has now expanded into a regional conflict and a massive humanitarian/immigration crisis.[22] Such risks underline the need for *precaution* and reducing emissions as much as possible as quickly as possible—a World War II-scale effort.

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[20] "What is a global warming potential? And which one should I use?" (Greenhouse Gas Management Institute, April 2014). http://ghginstitute.org/2010/06/28/what-is-a-global-warming-potential/

[21] "Arctic methane emissions 'certain to trigger warming'" (Climate Central 5/1/2014). http://www.climatecentral.org/news/arctic-methane-emissions-certain-to-trigger-warming-17374

[22] "Climate Change Helped Spark Syrian War, Study Says." *(National Geographic, 3/2/15).* http://news.nationalgeographic.com/news/2015/03/150302-syria-war-climate-change-drought/

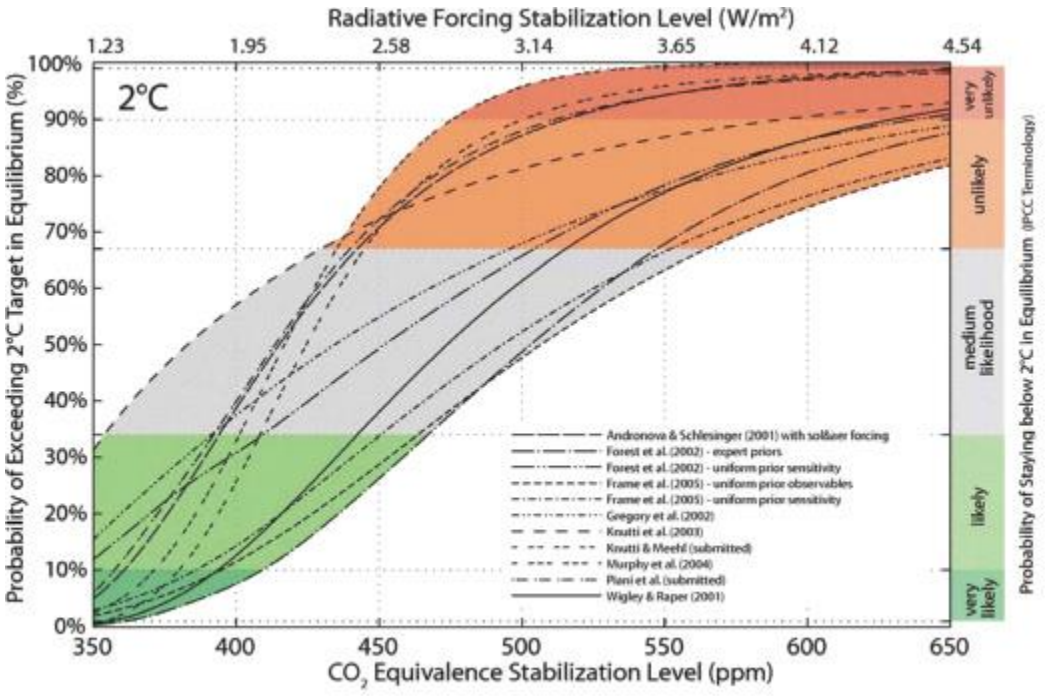
Ocean acidification—the CO_2 double whammy

Only a portion of the billions of tons of carbon dioxide we emit every year by burning fossil fuels stays in the atmosphere, where it traps heat. About a third of it dissolves in the oceans, where it does a different, but equally significant, kind of damage. Carbon dioxide acidifies water (lowers its pH), and as it does so it is expected to have direct adverse effects on certain marine animals, especially those that live in shells. As food sources for many other animals, from fish to birds to sea otters, shellfish are an important part of the ocean food web. The Pacific Marine Environmental Laboratory (PMEL) affiliated with the National Oceanic and Atmospheric Administration says that, as a result of human carbon dioxide emissions, the oceans are already 30 percent more acidic than they were before the Industrial Revolution. If we continue on the projected "business as usual" carbon emissions path, PMEL projects that the oceans will be 150 percent more acidic by 2100. While PMEL indicates that it is "premature" to attribute recent failures of farmed shellfish "crops" to human-induced ocean acidification, it does say that acidification poses a risk to the $100 million/year shellfish industry—and as it increases and affects the ocean food web, to the one billion people in the world for whom fish and shellfish are the main sources of animal protein.[23]

CLIMATE ACTION: What we need to do and three strategies that will do it

The nearly 1◦C warming we have already experienced has unleashed some alarming consequences, such as much-faster-than-expected melting and disintegration of glaciers and large ice sheets, along with observed methane releases from some Arctic regions. Scientists have agreed any warming above 2◦C greatly increases the risk of catastrophic consequences. While even a 2◦increase above pre-industrial temperatures cannot be called 'safe,' a 2◦C 'ceiling' may be the best we can do. It is not clear exactly what atmospheric concentration of greenhouse gases will correspond to a temperature rise of 2◦C. There are uncertainties in climate science, and 'climate sensitivity' (what equilibrium temperature will correspond to a given GHG stimulus) is one of the main areas of uncertainty, as the image below shows.

[23] http://www.pmel.noaa.gov/co2/story/What+is+Ocean+Acidification%3F



Probability (see 'Key caveat' above on low confidence for specific quantitative results) of exceeding an equilibrium global warming of 2°C above pre-industrial (1.4°C above 1990 levels), for a range of CO_2-equivalent stabilization levels. Source: Hare and Meinshausen (2005).

To quote directly from the page 2007 IPCC report from which this chart was taken, "To render eventual exceedance of this exemplary [2◦C] threshold 'unlikely' (<33% chance), the CO_2-equivalent stabilization level must be below 410 ppm for the majority of considered climate sensitivity uncertainty distributions (range between 350 and 470 ppm)." Because the current atmospheric concentration of carbon dioxide alone has reached 400 ppm, we are already venturing into very dangerous territory, and (because carbon dioxide stays in the atmosphere for such a long period), we must reduce our emissions drastically and immediately (80% globally by 2050), and accelerate natural processes that remove carbon dioxide from the atmosphere, such as reforestation, applying compost to soils on a large scale, and so on.

This Climate Action Plan describes what Brisbane will do to reduce its emissions by 15% below business-as-usual levels in 2020—a goal consistent with AB32. State goals are being ratcheted upward, however, so this CAP should be seen as a down payment on larger efforts to come.

Getting the carbon out

Carbon emissions result from almost everything we do, since fossil fuel burning generates most of the electricity we use and powers nearly all of our transportation.[24] That's why we've poured enough carbon into the atmosphere to warm the earth's climate in only a few hundred years. But that same fact means that there are lots of ways to reduce those emissions, many of which are both easy and inexpensive. Our personal choices—which foods we eat, how we get around, energy and water-thrifty habits around the house—can reduce emissions (also see Appendix B). But scientists tell us that in order to have a chance of stabilizing the climate at no more than 2◦C (about 3.6◦F) above pre-industrial temperatures, we've got to have *policies* in place that can swing our whole society—individuals, corporations, governments—into the post-fossil fuel era, and quickly. Those policies are what Brisbane's Climate Action Plan is all about.

http://www.coolcalifornia.org/article/step-3-develop-a-climate-action-plan

Reducing emissions from fossil fuels: Three Strategies

As author Ozzie Zehner points out in his valuable book *Green Illusions,*[25] images of windmills and solar panels come quickly to most of our minds when we consider climate change and what to do about it. Almost all climate analysts agree that coal, oil and natural gas must play rapidly-diminishing roles—roles so diminished that they completely disappear from our energy mix in less than a century. But that does not mean that climate policy should be envisioned simply as "changing out" our current fossil fuel energy sources for wind and solar. The ways we use energy, and how much we use, have to change, too. That is because although the sun delivers more energy to the earth daily than we can use, solar energy is diffuse—that is, every square meter of the earth's surface receives a relatively small amount of solar energy. Capturing enough of it to power an energy-hungry way of life therefore requires a lot of space, and rooftops alone will not be sufficient to power installations such as computer server farms. For example, the newly-operational Ivanpah solar-thermal plant south of Las Vegas has a power-production capacity of 392 megawatts (MW), or enough to power about 140,000 homes (a medium-sized conventional power plant produces about 500 MW)—and it occupies roughly 4,000 acres, or five square miles, of land. Siting that plant was controversial,

[24] Emissions from deforestation and agriculture are important parts of the overall climate change picture, too, as are methane emissions from landfills, which are addressed in the "Solid Waste" portion of the Brisbane CAP.
[25] University of Nebraska Press, 2012.

because it is located in an area where (federally-endangered) desert tortoises live. A number of them had to be relocated, and some did not survive. Similar problems are likely to arise at other sites, meaning that the fewer such power plants are necessary, the better off habitats and ecosystems are likely to be. Wind turbines, too, can damage ecosystems, largely because of bird kills, so they have to be sited carefully. Moreover, both wind and solar are *intermittent sources*, so solar plants and wind turbines don't always perform at capacity.[26] Energy storage and building transmission lines over large areas can help to even out or compensate for intermittency, but the main takeaway from all this is that measures to *minimize energy demand* are absolutely central to an effective emissions-reduction policy.

The three main strategies to reduce carbon emissions from fossil fuels:

****Efficiency—getting "more bang for the buck"***

****Conservation—reducing the need for, and use of, fossil fuel energy***

****Substituting no/low carbon renewables for fossil fuels***

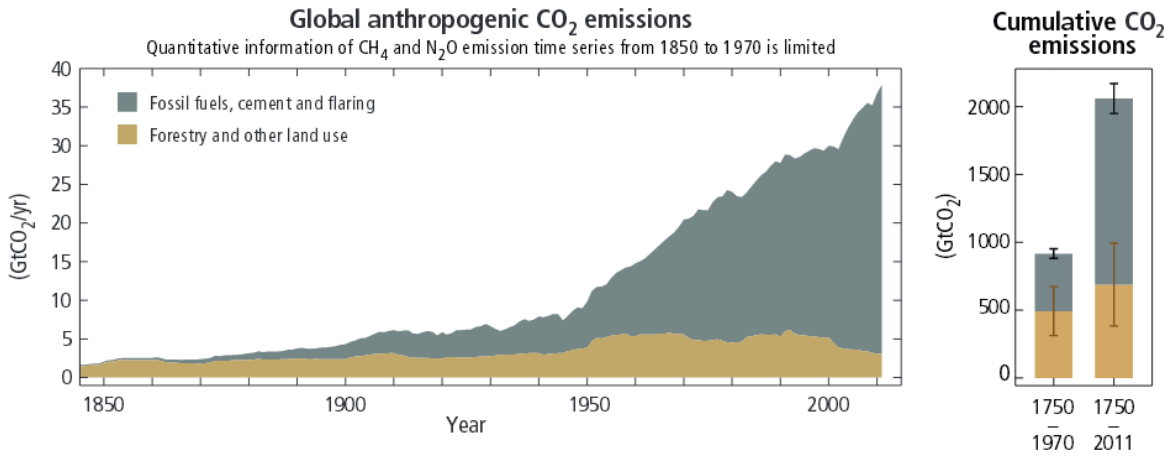
As you read this Climate Action Plan, you will notice that while many of the recommended policies and measures, such as Brisbane's participation in studying a Community Choice Aggregation/Energy Plan for San Mateo County, are intended to support and facilitate the installation and use of low-carbon energy sources (primarily solar), others are intended to reduce emissions by minimizing demand. Measures to improve the efficiency—and thereby reduce energy use while maintaining the same level of service—in residential, commercial and government buildings, are central. Similarly, the Plan proposes that the City adopt policies to purchase a range of products that operate at high levels of energy efficiency. Behavioral changes are addressed in the Plan as well: it recommends measures like reducing exterior night-lighting, tree-planting to keep the city cool and reduce demand for energy-intensive air conditioning, and incentivizing local hiring to reduce commuting, transportation being one of the major sources of emissions in the Bay Area.

Emissions-reduction opportunities in water efficiency and solid waste

[26] http://www.reviewjournal.com/business/energy/giant-ivanpah-solar-plant-south-las-vegas-falls-short

You'll see that incentives to reduce water use and increase water efficiency, e.g., with drought-tolerant landscaping, are included in the Brisbane CAP. That's because moving water around, water treatment and other water-related uses take almost a fifth of all the energy used in California.[27] Reducing solid waste sent to landfill is another measure that may not seem closely related to climate change, but it is. Solid organic waste, such as food waste and old newspapers, produces methane when it decays in the absence of oxygen, as it does when landfilled. As explained earlier, methane is a very important greenhouse gas, and reducing methane emissions can make a significant difference in the amount of short-term warming we experience.

The following graphic from the Intergovernmental Panel on Climate Change (IPCC), the leading international scientific body on climate change, shows the growth and distribution of anthropogenic (human-caused) greenhouse gas emissions in the atmosphere.


Global anthropogenic CO_2 emissions
Quantitative information of CH_4 and N_2O emission time series from 1850 to 1970 is limited
Fossil fuels, cement and flaring
Forestry and other land use
$(GtCO_2/yr)$
Year
Cumulative CO_2 emissions
$(GtCO_2)$
1750 – 1970
1750 – 2011

https://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_FINAL_full_wcover.pdf

Annual global anthropogenic carbon dioxide (CO_2) emissions (gigatonne of CO_2-equivalent per year, $GtCO_2/yr$) from fossil fuel combustion, cement production and flaring, and forestry and other land use (FOLU), 1750–2011. Cumulative emissions and their uncertainties are shown as bars and whiskers, respectively, on the right-hand side.

Additional Resources about Climate Change

- International Panel of Climate Change Fifth Assessment Report: http://www.ipcc.ch/report/ar5/wg1/
- U.S. Global Change Research Program http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts
- Pew Center on Climate Change: http://www.pewclimate.org/
- National Ocean and Aeronautical Administration (NOAA) http://www.climate.gov/#Data_And_services
- U.S. Environmental Protection Agency: http://www.epa.gov/climatechange/indicators.html
- Real Climate http://www.realclimate.org/

1.1 State Policy and Regulatory Context

The State of California has been a leader in developing and implementing policies and regulations to directly address the risk of severe climate change. Below we summarize the key statewide legislation aimed to reduce GHG emissions. There are many supporting pieces of legislation and other related initiatives that are sector specific. These are more fully described in Chapter 3.

Assembly Bill 32, the California Global Warming Solutions Act of 2006

In September 2006, the California legislature passed Assembly Bill (AB) 32, which set the goal of reducing GHG emissions back to 1990 levels by 2020, and Governor's Executive Order S-3-05 set the goal at 80 percent below 1990 levels by 2050[28]. AB 32 finds and declares that "global warming poses a serious threat to economic well-being, public health, natural resources and the environment of California." The legislation granted authority to the Air Resources Board to establish multiple mechanisms (regulatory, reporting, voluntary and market) to achieve quantifiable reductions in GHG emissions to meet the statewide goal.

Assembly Bill 1493, the Pavley Bill

In 2002, the California legislature enacted Assembly Bill (AB) 1493 (aka "the Pavley Bill"), which directs the Air Resources Board to adopt standards that will achieve "the maximum feasible and cost-effective reduction of greenhouse gas emissions from motor vehicles," taking into account environmental, social, technological, and economic factors. In September 2009, the Air Resources Board adopted amendments to the "Pavley" regulations to reduce GHG emissions in new passenger vehicles from 2009 through 2016.

Senate Bill 375

In September 2008, Senate Bill (SB) 375 was signed into law to provide emissions reduction goals related to vehicle-miles traveled on a regional planning level. The bill seeks to align regional transportation planning efforts with regional GHG reduction targets and land use and housing allocations. SB 375 requires metropolitan planning organizations (MPOs) to adopt a sustainable communities strategy or alternative planning strategy. The Air Resources Board, in consultation with the MPOs, has set a per capita GHG reduction target for emissions of passenger cars and light trucks in the San Francisco Bay Area of 7 percent below 2005 levels by 2020, and 15 percent below 2005 levels by 2035. In July of 2013, Plan Bay Area, a long-range integrated transportation and land-use/housing strategy through 2040 for the San Francisco Bay Area, was jointly approved by the Association of Bay Area Governments (ABAG)

[28] http://gov.ca.gov/news.php?id=1861

Executive Board and by the Metropolitan Transportation Commission (MTC). The Plan includes the region's Sustainable Communities Strategy and the 2040 Regional Transportation Plan and represents the next iteration of a planning process that has been in place for decades.

California 33 Percent Renewable Portfolio Standard (RPS)

California's Renewable Portfolio Standard (RPS) was originally established by legislation enacted in 2002. Subsequent amendments to the law have resulted in a requirement for California's electric utilities to have 33 percent of their retail sales sourced from eligible renewable resources in 2020 and all subsequent years. Renewable resources include wind, solar, geothermal, wave, and small hydroelectric power.

1.2 Regional Efforts

The following regional efforts promoting GHG reductions are already under way:

City/County Association of Governments of San Mateo County (C/CAG). C/CAG is a council of governments consisting of the County of San Mateo and its 20 cities. The organization deals with topics such as transportation, air quality, stormwater runoff, hazardous waste, solid waste and recycling, land use near airports, abandoned vehicle abatement, and issues that affect quality of life in general. C/CAG supports a number of sustainability initiatives including the following:

- ***San Mateo County Energy Watch.*** This program is a local government partnership between PG&E and C/CAG to promote energy efficiency in municipal and non-profit buildings. The program is managed and staffed by RecycleWorks, a program of the County of San Mateo.

- ***Congestion Management Agency.*** C/CAG serves as the Congestion Management Agency for San Mateo County to identify strategies to respond to future transportation needs, develop procedures to alleviate and control congestion, and promote countywide solutions.

Energy Upgrade California in San Mateo County. This San Mateo program aims to help residential consumers make improvements to their homes so they will use less energy, conserve water and other natural resources, and become healthier and more comfortable. The program connects homeowners with participating contractors who can help plan and complete energy efficiency projects and take advantage of rebates. Energy Upgrade California is a partnership among California counties, cities, non-profit organizations and the state's investor-owned utilities (e.g. PG&E).

Joint Venture: Silicon Valley Network. Established in 1993, Joint Venture: Silicon Valley Network provides analysis and action on issues affecting the local economy and quality of life. The organization brings together established and emerging leaders -- from business, government, academia, labor, and the broader community -- to spotlight issues and work toward innovative solutions. Joint Venture is dedicated to promoting climate-friendly activities that help the local economy and improve quality of life in Silicon Valley.

PG&E's Sustainable Communities Team. A PG&E Community Energy Manager, Sapna Dixit, has been assigned to San Mateo County to work jointly with each municipality to develop a comprehensive energy management strategy that the city can implement across institutional, residential, business, and industrial sectors. In addition, PG&E can provide city and county energy usage data, GHG inventory assistance and information on innovative pilot grant funding for projects that help to reduce GHG emissions in each community.

Silicon Valley Leadership Group (SVLG) Bay Area Climate Change Compact. SVLG is an organization consisting of principal officers and senior managers of member companies to work cooperatively with local, regional, state and federal government officials to address major public policy issues affecting the economic health and quality of life in Silicon Valley. In 2009, SVLG organized the Bay Area Climate Change Compact, which establishes a framework for regional cooperation and setting aggressive goals for the reduction of greenhouse gas emissions.

Sustainable San Mateo County (SSMC). SSMC was established in 1992 by a group of San Mateo County citizens who sought to create a broader awareness of the sustainability concept. SSMC supports multiple programs to promote energy efficiency, alternative transportation and education on sustainability concepts which focus on the intersections of the environment, the economy and social equity. SSMC's Energy Ambassador program supports the Energy Upgrade California program by providing homeowners free personal energy reviews and education on home energy efficiency.

Sustainable Silicon Valley (SSV). In 2004, SSV organized a regional voluntary initiative, setting a visionary target of reducing CO_2 emissions by 20% below the region's 1990 levels by the year 2010. SSV partners participating in the voluntary CO_2 emissions reduction program determine their own baseline year and a CO_2 percentage reduction goal to reach by 2010. Each pledging partner also chooses how they will meet this target. Options abound – from improvements in equipment efficiency to energy conservation, the use of renewable energy sources, and purchase of green power and/or promotion of alternative commute options.

1.3 Local Efforts

While cities may be vulnerable to climate impacts, they also can play a critical role in reducing the emissions that exacerbate climate impacts. With their concentrations of people and

activities at high densities, cities can use resources such as energy, materials, and land more efficiently. Cities are places where high-level knowledge-based activities congregate, along with the expertise needed to tackle climate change. This is especially true in the San Francisco Bay Area.

AB 32 identifies local governments as essential partners in achieving California's goal to reduce GHG emissions. Cities have varying degrees of responsibility for the collection and processing of waste and have responsibility for other environmental infrastructures, such as energy and water. Cities own and manage buildings and vehicle fleets and are able to form partnerships with private interests to mobilize and coordinate community action. Furthermore, cities are uniquely positioned to promote economic development that emphasizes sustainable development and local green-collar jobs.

To date, the City of Brisbane has undertaken the following sustainability efforts:

Photo of San Bruno Mountain. Credit to: D. Coetzee

Energy:

The City of Brisbane has completed several measures to reduce energy use. The City Hall facility was remodeled with an energy efficient HVAC system and motion sensing office lighting and a lighting control system for common areas. The building was subsequently awarded an Energy Star for reduced energy use. Energy audits and retrofits to improve energy performance and reduce greenhouse gas emissions have occurred at most other Brisbane municipal facilities, including site and interior lighting upgrades and HVAC control improvements.

The majority of street lights in Brisbane have been converted to LEDs to reduce energy use and increase longevity of the bulbs.

Solar thermal panels and a variable frequency drive for the circulation pump have been installed at the Brisbane Community Pool to reduce energy costs related to heating the pool. In addition, a thermal pool cover was purchased to place over the pool when not in use.

In 2013 Brisbane began participating in the ZipCar car share program with the placement of two hybrid vehicles in a visible, high traffic area. The cars can be utilized for a fee by community and staff members.

After the latest California Building Energy Efficiency (Title 24) code updates became effective on July 1, 2014, Brisbane hosted training on “Compliance Enhancement Strategies for Residential Buildings”, administered by the Bay Area Regional Energy Network. The City of Brisbane also promotes energy saving programs such as: CaliforniaFIRST energy efficiency financing, Peninsula SunShares bulk solar purchase program, Energy Upgrade California and the San Mateo County Energy Watch Challenge for small businesses.

Water Use:

Brisbane remains among the lowest per capita water users in San Mateo County. We continue to participate in regional water conservation programs offering rebates to qualified customers for high-efficiency clothes washers, high-efficiency toilets and rain barrels, as well as offer landscape audits to our largest commercial users.

Guidelines have been developed by the city to support the capture and reuse of rainwater in a safe and effective manner. The instructional guidelines provide residents with education and information on how to conserve potable water by collecting, storing and utilizing rainwater for outdoor applications.

Brisbane’s water conservation program involves public education and outreach, an ordinance prohibiting water waste, as well as a water-efficient landscaping ordinance that requires large landscape plans to show use of drought-tolerant plants and water-efficient irrigation.

Brisbane partnered with a local conservation group that is recovering and restoring an earthen vee-ditch (previously mowed down to nearly bare earth every year) with native plant materials. There has been no noticeable decrease in the stormwater capacity of this facility, but there has been a substantial increase in the output of the water quality after stormwater winds its way through the planted bottom of the "vee creek". A significant corollary benefit is that the in-stream plants are now home to several species of native animals, including insects, amphibians, and birds.

A rain garden and bioswale at Brisbane City Hall captures runoff water from the roof and parking lot before it enters the City's storm drain system. The engineered bioretention areas collect and treat runoff by filtering it through selected vegetation, thus keeping pollutants out of

the San Francisco Bay. The project was funded in part by a San Mateo County Stormwater Pollution Prevention Program Demonstration Project grant and features an informational sign.

Waste Reduction:

The City of Brisbane renegotiated its franchise agreement with South San Francisco Scavenger (SSFS) in 2014. As a result, SSFS implemented a residential food scraps collection program in January 2015. Food waste bins were provided to all Central Brisbane residents to collect scraps before placement in the green compost collection bin in advance of the scheduled pick-up. Green waste bins are picked up weekly, as compared to every two week before the food scrap program was put in place. In response to the City's request, SSFS provides for collection of recyclable plastic bags, which further reduces waste.

Brisbane City Council adopted a plastic bag ban in 2013 and a polystyrene ban in 2014. Both of these ordinances are modeled after and administered by San Mateo County's Environmental Health Division. Adoption of such ordinances has been shown to reduce trash accumulation in landfills and waterways, as well as benefit wildlife from the reduced litter.

According to the South San Francisco Scavenger company, Brisbane's 2013 diversion rate was 80%, which is above the state diversion goal of 75% by 2020[29]. Residents may recycle batteries, light bulbs, and plastic bags at a waste collection site at City Hall, local hardware store and/or the local post office.

Brisbane's construction and demolition ordinance requires the following: For demolition, 100% of inert solids and 50% of debris must be diverted. Construction and remodeling requires 50% diversion of all construction and demolition debris. Salvage and recovery requirements for a demolition project are as follows: prior to demolition an applicant shall make the structure planned for demolition available for salvage and recovery.

City Council and upper and middle management staff utilize iPads to view agenda packages rather than printed copies. The Open Space and Ecology Committee (OSEC) has opted to make their meeting packet electronic. During OSEC meetings, Power Point software and monitors are utilized to view materials.

City staff computers are refurbished rather than replaced new. Copy paper products purchased are recycled. Packaging materials and mailing envelopes are recycled. Building plan check is

[29] http://www.calrecycle.ca.gov/75percent/

performed digitally rather than on paper. City makes large documents of community interest available for digital download and prints copies upon request only.

Road Emissions/Transportation:

Brisbane pays into a shuttle consortium with other businesses in Crocker Industrial Park to participate in the Peninsula Congestion Relief Alliance Shuttle service to transport residents and workers to and from the Brisbane Caltrain stop and the nearest BART station. Brisbane distributes shuttle pass cards to employees and residents of Brisbane upon request. Brisbane is the top user of the commute.org shuttle service.

The city recently adopted a Safe Pedestrian Routes to Schools Plan to improve pedestrian routes and make them safer for children to walk to school and bus stops, as well as pedestrians walking to markets, the library, community centers, the community park and various other parks and ball fields, and the community pool.

Brisbane recently installed rapid reflective flashing beacons for two crosswalks at intersections; one adjacent to the elementary school, and one close to and on the middle school route, at an uncontrolled crossing in the downtown business district. Providing improved safety measures at these street crossings will encourage more walking and bicycling for short trips and reduce reliance on the automobile.

All Sector:

The City Council adopted a Baylands Sustainability Framework based on the ten One Planet Communities principles for the large portion of undeveloped land in its northeast quadrant.

The City has adopted a Climate Friendly Purchasing Guide incorporated into this CAP and to be implemented by staff with guidance from the Open Space & Ecology Committee.

The city has adopted an ordinance to set fixed solar permit fees for residential permits and will provide expedited solar permitting review to promote adoption of rooftop photovoltaic systems, per solar streamlining bill AB 2188.

The City of Brisbane, together with the City and County of San Francisco, obtained Priority Development Area (PDA) status from the Association of Bay Area Governments for 574 acres of Bi-County Baylands property. PDA status is generally conferred on infill development opportunity areas that are primed for a pedestrian and bicycle-friendly environment served by transit.

In addition to significant aquatic and open space resources at the Baylands, the City has acquired approximately 48 acres of land on San Bruno Mountain to protect as open space per the City adopted Open Space Plan. This property is within the San Bruno Mountain Habitat Conservation Plan (HCP), and provides habitat for endangered butterfly species and host plants.

Brisbane has established a vegetation management program to control the encroachment of invasive plants and sustain the native habitat value of the City's open space on San Bruno Mountain adjacent to San Bruno Mountain State and County Park. A vegetation management plan is developed each year by a community advisory committee, and the restoration work is then carried out by contractors.

Brisbane continues to maintain and expand its extensive array of open space and outdoor facilities in the form of parks, athletic fields (soccer and softball), tennis courts, basketball courts, a community pool, a skatepark, walking and biking paths along the bay shore and paths and trails adjacent to San Bruno Mountain.

The City of Brisbane, together with San Mateo County and the City of South San Francisco, has applied for Priority Conservation Area status for the San Bruno Mountain area/habitat from the Association of Bay Area Governments and the Metropolitan Transportation Commission. Brisbane's portion of the application seeks to include a number of areas adjacent or related to San Bruno Mountain that host native plants and habitat for endangered species, including the several endangered butterflies whose habitat exists on these properties. Several of the areas have the additional benefit of serving as recreation opportunities.

In spring 2012, the City of Brisbane launched a year round weekly Farmers Market, in partnership with the West Coast Farmers Market Association. The close knit residential community and large business community have been enjoying local organic produce, fresh food and other related products while minimizing Brisbane's carbon footprint.

The City permits the raising of fowl and beekeeping and has a thriving community garden and community orchard. Chapter 6.14 of the Municipal Code allows up to a total of four fowl, birds, rabbits or rodents on one property, unless special permits are obtained. Bees are kept on city property adjacent to the local community garden and are maintained by community members.

The Open Space and Ecology Committee (OSEC) has an Education and Outreach subcommittee that educates the public on sustainability and environmental issues. OSEC provides input to staff regarding a Sustainability page on the city's website, an environmental

library shelf at Brisbane branch of the San Mateo County public library system, and writes articles and creates materials for print and social media.

The Open Space and Ecology Committee hosts three to four events per year: Earth Day, Habitat Restoration Day, a Lagoon Cleanup Day and an informational booth at the annual Day in the Park. Earth Day and Habitat Restoration Day target local outdoor areas in need of invasive non-native plant species and litter removal. Litter is removed from Brisbane Lagoon on Lagoon Cleanup day, which coincides with the California Coastal Commission Cleanup Day. Day in the Park is a community festival in which OSEC develops displays and hands out materials on sustainability and environmental issues to the public. The Brisbane community is greatly involved in all these events.

The City adopted an Open Space Plan to guide the acquisition of lands that were determined to be the most significant natural and open space resources, primarily in the Brisbane Acres. The City further established a special fund for the enhancement of open space and trails as a result of the sale of the Sheng Kee Bakery property.

Citizen groups involved:
City Council, the Planning Commission, Green Building Ordinance Subcommittee, Sustainability Subcommittee, the Open Space and Ecology committee has all been instrumental in working with staff to develop these initiatives. The Open Space and Ecology committee had significant input into this Climate Action Plan.

1.4 City of Brisbane's Climate Action Plan Process

This climate action plan was developed in partnership with the City and County Association of Governments of San Mateo County (C/CAG). The C/CAG RICAPS template and Brisbane's climate strategy is based on the ICLEI ─ Local Governments for Sustainability (previously known as International Council for Local Environmental Initiatives) 5-Milestone process as seen in the framework below.

1.4.1 Framework for Climate Action

The ICLEI 5-Milestone process is a management process based on increasing knowledge through each step to achieve the targeted GHG emissions reductions.

Iterative Management Processes for Climate Action (Source: ICLEI)

- **Leadership Commitment:** Define the overall vision and goals for the community.
- **Milestone 1 (Inventory Emissions):** Conduct a baseline emissions inventory and forecast.
- **Milestone 2 (Establish Target):** Adopt an emissions reduction target for the forecast year.
- **Milestone 3 (Develop Climate Action Plan):** Identify feasible and suitable strategies and supporting actions to reduce emissions and achieve co-benefits aligned with the overall vision and goals.
- **Milestone 4 (Implement Climate Action Plan):** Enact the plan.
- **Milestone 5 (Monitor/Evaluate Progress):** Establish feedback loops to assess and improve performance, including an assessment and adjustment of the necessary human, financial and data resources.

In November 2009, all San Mateo County member jurisdictions completed their 2005 community and municipal GHG inventories as part of a joint effort with ICLEI, Joint Venture Silicon Valley Network, and the County of San Mateo, funded by C/CAG. This C/CAG assisted Brisbane and other member jurisdictions with Milestones 2 and 3. The City of Brisbane is responsible for implementing the actions identified in this climate action plan to complete Milestone 4.

To support Milestone 5, C/CAG is working with jurisdictions to study online forecasting and calculation tools to allow its jurisdictions to track total community GHG emissions. A chosen tool will assist cities to monitor the effectiveness of emissions reduction efforts by tracking GHG emissions and emission reductions achieved from various strategies.

OSEC committee member at the OSEC booth on Day in the Park community event.

1.4.2 Public Outreach and Community Engagement

The OSEC citizen advisory committee's Climate Action Plan (CAP) subcommittee worked together with staff to develop this Climate Action Plan. Review of drafts of the CAP took place during televised public OSEC meetings. Videos of the meetings were replayed on community cable access Channel 27 and are available on the city's website together with the meeting materials. Outreach via the city's weekly Community Engagement email blast, city publications and newsletters, city Facebook page, city website, community channel and local sign boards was performed to encourage community members to attend meetings to give input on the CAP. A slide requesting community input was also circulated on the community cable access channel. The completed CAP will be reviewed for consideration for adoption by City Council at a public meeting.

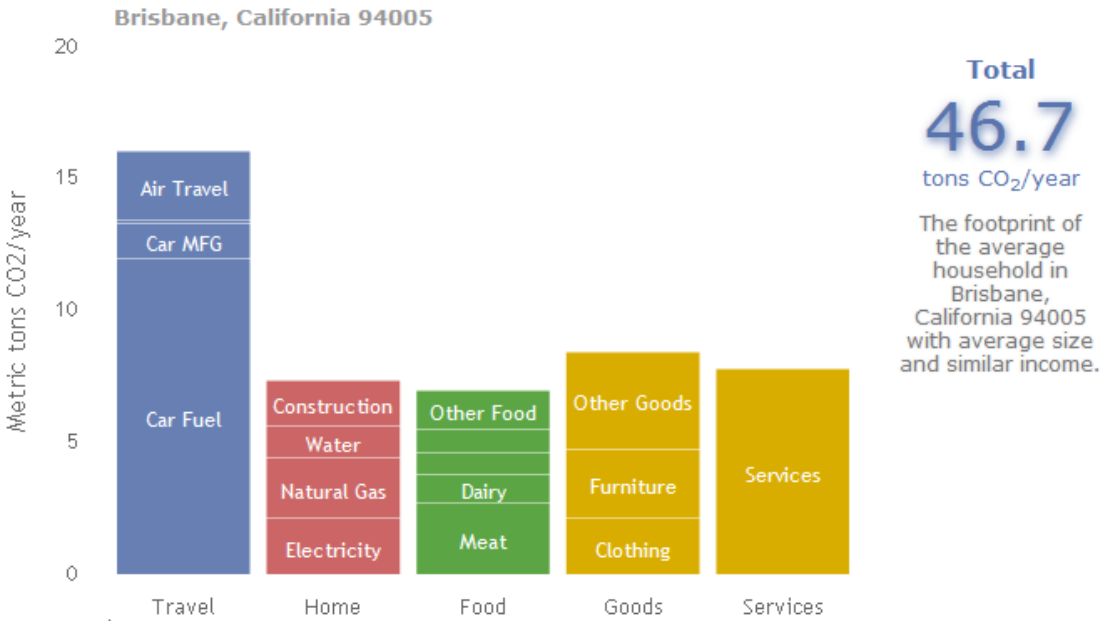
The CAP proposes an ad hoc citizen oversight committee during implementation consisting of members from the community, and including minorities and youth.

The plan will also outline outreach and education initiatives for the community to instill behavior change and encourage participation.

2 Greenhouse Gas Inventory and Forecast

The emissions inventory provides an important foundation for the climate action plan, providing a baseline year (2005), against which progress toward the City goal of reducing greenhouse emissions 15% by 2020 can be measured. The completed plan will include a business-as-usual (BAU) forecast of GHG emissions, which will enable the City of Brisbane to estimate the amount of emissions reductions needed to meet its goal.

Greenhouse gas reductions are measured in units of Metric Tons of Carbon Dioxide equivalents (MT CO_2e). The average household in Brisbane has a carbon footprint of approximately 46.7 metric tons of carbon dioxide equivalents per year. The carbon footprint per average household in the Bay Area is higher than both California (43.9 metric tons of carbon dioxide for the same time period) and the United States due to the median income being greater. This number is based on lifestyle and consumption of resources, travel modes, energy consumption, dietary choices, and goods and services used. Meat and dairy are make up a large portion of the food component on the graph because production of similar amount of meat or dairy versus whole grains causes a disproportionate amount of greenhouse gas emissions. For ways to lower your carbon footprint review appendix B for 10 steps to incorporate into your lifestyle. The Cool Climate Network Carbon Calculator for households includes air travel, goods and services purchased, where other carbon footprint calculators do not take these components into account (see detailed report on assumptions and calculations).[30]



[30] https://docs.google.com/file/d/0B_og3XZlL1dbLXRoSmtaYWVFRWc/edit

http://coolclimate.berkeley.edu/calculator

To better grasp the scale and size of a metric ton of carbon dioxide equivalents, the cube in the photo below represents one metric ton of carbon dioxide:

http://greenblizzard.com/carbon-basics/

2.1 Inventory Sources and Data Collection Process

An inventory of GHG emissions requires the collection of information and data from a variety of sectors and sources. The emissions inventory completed for the City of Brisbane follows the standard outlined in the BAAQMD's GHG Plan Level Quantification Guidance (dated May 2012) as well as the Local Government Operations Protocol[31].

[31] Local Government Operations Protocol – For the quantification and reporting of greenhouse gas emissions inventories (Version 1.0). Developed in partnership by California Air Resources Board, California Climate Action Registry, ICLEI – Local Governments for Sustainability, and The Climate Registry. September 2008. Note that a newer version (version 1.1, dated May 2010) of the LGOP is available; however, at the time the GHG inventory was completed for the City of [CITY], version 1.0 was the only version available.

Table 1 summarizes the sectors, emissions sources, and energy types included in our GHG inventory.

Table 1: Sectors and Emissions in the GHG Inventory

Sector	Emissions sources	Energy types
Residential	Energy and water use in residential buildings	Electricity Natural gas
Commercial	Energy and water use in commercial, government and institutional buildings	Electricity Natural gas
Industrial	Energy and water use in industrial facilities and processes	Electricity Natural gas
Transportation and Land Use*	All road vehicles Public transportation Light rail Off-road vehicles/equipment	Gasoline Diesel Compressed natural gas Liquefied natural gas Biodiesel
Waste	Landfills Waste stream	Landfill gas (methane)

* Some sectors may be updated in a new version of the BAAQMD GHG Plan Level Quantification Guidance.[32]

While the BAAQMD GHG Plan Level Guidance recommends the inclusion of GHG emissions from water processing, delivery and wastewater treatment that occurs outside of the city's boundary, these emissions are not included in Brisbane's baseline inventory due to lack of data on the energy used for water processing and delivery and wastewater treatment in the baseline year. The following are emission sources that are mentioned in the BAAQMD GHG Plan Level Guidance, but were excluded from the Brisbane's inventory because they are not applicable in Brisbane: airports and sea ports, non-road vehicle use (planes, trains, ships), and water travel. In the next version of the CAP, we will attempt to capture emissions from water travel originating and ending at the Brisbane Marina.

PG&E measures and reports system-wide "Distribution Fugitive Natural Gas Emissions" to a variety of entities. Based numbers provided by PG&E on fugitive methane leaks, there is approximately 47 $MTCO_2e$ of methane leakage associated with delivering gas to Brisbane annually. The City of Brisbane has requested PG&E to give information on their ongoing program to address these leaks. Because these repairs are the responsibility of PG&E their associated emissions are not included in the GHG inventories for Brisbane.

ICLEI recently developed the U.S. Community Protocol[33], which is the first U.S.-specific protocol for developing community-wide greenhouse gas emissions estimates. All future inventories

[32] For updates to the GHG Plan Level Quantification Guidance, check the BAAQMD website: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx

[33] U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (Version 1.0). Developed by ICLEI – Local Governments for Sustainability. October 2012.

should utilize this protocol. Future inventories will also utilize the most recent version of the Local Government Operations Protocol, as well as any updated guidance from the BAAQMD.

The industry-accepted methodology for quantifying a community-wide GHG emissions inventory focuses on emissions that occur from combustion sources within city limits and from electricity consumption. In the future, there may be the opportunity and need to quantify GHG emissions associated with the goods and products procured by communities and its residents. This type of lifecycle emissions accounting is not included in this climate action plan.

2.2 Baseline Emissions Inventory for 2005

In the base year of 2005, the City of Brisbane emitted approximately 70,946 metric tons of carbon dioxide equivalents (CO_2e) from the residential, commercial, industrial, transportation, waste, and municipal sectors.[34] Municipal sector emissions are calculated and reported because the City of Brisbane generally has more control over these emissions than emissions from the other sectors, and thus the City of Brisbane can implement specific policies and programs to reduce these municipal emissions. However, in the context of the community-wide inventory, the municipal emissions are included in the commercial/industrial sector. Burning fossil fuels in vehicles and for energy use in buildings and facilities is the largest contributor to Brisbane's GHG emissions. Table 2 provides a summary of total citywide (i.e. community and municipal) GHG emissions. Table 2.1 provides a summary of total citywide GHG emissions for 2010.

[34] Carbon dioxide equivalent is a unit of measure that normalizes the varying climate warming potencies of all six GHG emissions, which are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). For example, one metric ton of methane is equivalent to 21 metric tons of CO_2e. One metric ton of nitrous oxide is 210 metric tons of CO_2e.

Table 2: 2005 Community Emissions by Sector

Sector	Greenhouse Gas Emissions (metric tons CO_2e)	Percentage of Greenhouse Gas Emissions
Residential	5,711	8.0%
Commercial/Industrial	23,588	33.2%
Transportation – On road	29,665	41.8%
Transportation – Off-road equipment	6,287	8.9%
Solid Waste – Landfills	4,212	5.9%
Solid Waste – Generated Waste	1,483	2.1%
TOTAL	**70,946**	100%

Table 2.1: 2010 Community Emissions by Sector

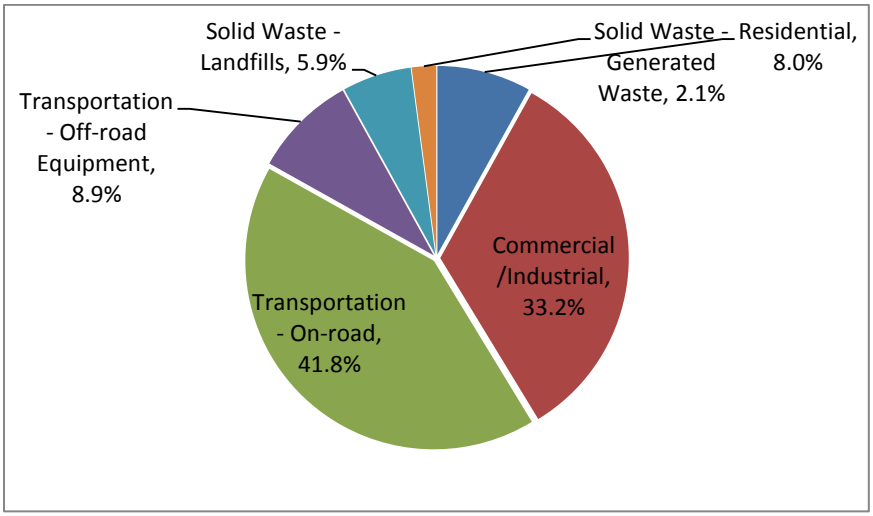
Sectors Included in the Baseline Inventory	GHG Emissions (metric tons CO_2e)	Percentage of GHG Emissions
Residential	5,847	4.0%
Commercial/Industrial	19,976	13.5%
Transportation – Local roads	21,076	14.2%
Transportation – State highways	82,113	55.5%
Transportation – Off-road equipment	6,635	4.5%
Solid Waste – Landfills	6,111	4.1%
Solid Waste – Disposed Waste	1,084	0.7%
SUBTOTAL	**142,843**	**96.5%**
New Sectors (not included in the Baseline Inventory)	**GHG Emissions (metric tons CO_2e)**	**Percentage of GHG Emissions**
Stationary Sources	2,449	1.7%
Transportation – CalTrain	2,280	1.5%
Transportation - Freight Trains	301	0.2%
Wastewater	72	0.05%
Water	82	0.1%
SUBTOTAL	**5,183**	**3.5%**
Total of 2010 Emissions*:	**142,843**	**$MTCO_2e$**
Total of 2005 Baseline Emissions**	**158,096**	**$MTCO_2e$**
Total Decrease from the 2005 Baseline	**-15,253 -10%**	**$MTCO_2e$**

* Total 2010 emissions only include sectors and sources that were included in the original 2005 baseline inventory. As shown in Table 1, new sectors and sources accounted for an additional 5,183 MT CO_2e. These new sectors and sources were not included when making comparisons between 2005 baseline and 2010 emissions levels.

** Total 2005 baseline emissions exclude previously-reported Direct Access natural gas. The Direct Access natural gas consumption was erroneously double-counted in the baseline 2005 inventory.

The residential, commercial, and industrial sectors represent emissions that result from electricity and natural gas used in both private- and public-sector buildings and facilities. The transportation sector includes emissions from private, commercial, and fleet vehicles with trips originating and/or terminating within Brisbane's city boundaries as well as the emissions from transit vehicles and the City-owned fleet. Off-road equipment includes lawnmowers, garden equipment, and construction, industrial, and light commercial equipment. Figure 4 shows the proportion of Brisbane's total GHG emissions from all major sources for 2005.

Figure 4: Community Emissions by Sector[35] 2005


Solid Waste - Landfills, 5.9%
Solid Waste - Generated Waste, 2.1%
Residential, 8.0%
Transportation - Off-road Equipment, 8.9%
Commercial /Industrial, 33.2%
Transportation - On-road, 41.8%

As shown above, the two largest sources of emissions are on-road transportation and building energy use (both residential and commercial/industrial).

2.2.1 Electricity and Natural Gas Emissions

The emissions from electricity and natural gas were calculated based on guidance in the Community GHG Protocol, and reported by the BAAQMD. Emissions from stationary combustion of natural gases were calculated based on methods in the GHG Community Protocol.

Commercial/industrial and residential activity data was obtained from Pacific Gas and Electric Company (PG&E). Direct access data for commercial/industrial accounts was provided by the California Energy Commission (CEC) for the entire county, which was then apportioned to Brisbane. Direct access service is an optional service that allows customers to purchase electric supplies and additional energy services on the wholesale market, rather than from PG&E. Direct access is currently not available for residential customers. Natural gas consumption data was provided by PG&E.

For Direct access CO_2, and all electricity-related CH_4 and N_2O emissions, the California grid-average electricity emission factors were used (total state-wide electricity-related GHG emissions divided by the total electricity consumption).

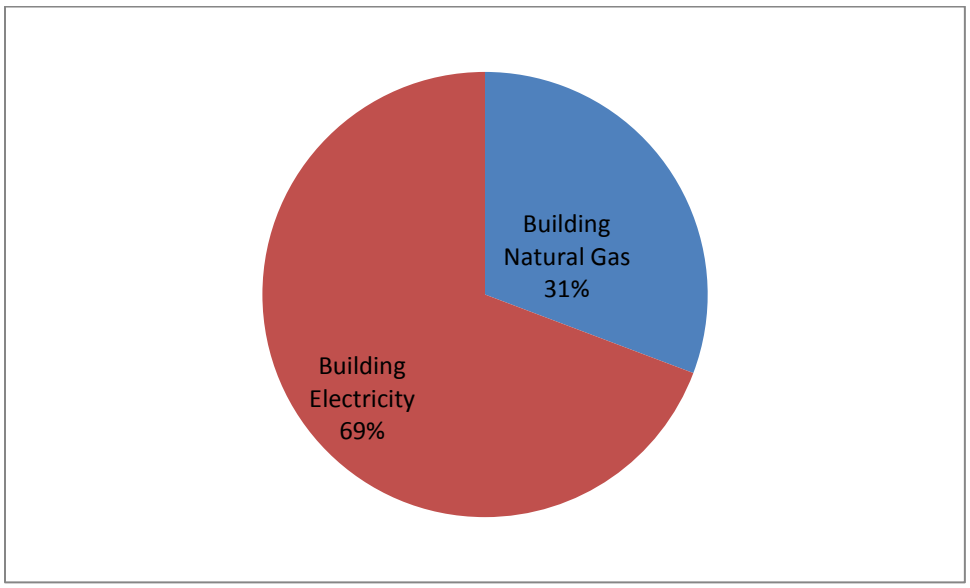
[35] While Brisbane's water emissions are not displayed separately in the chart above, they have been accounted for in the commercial/industrial and residential building energy sectors.

Table 2.2 Residential/ Industrial Energy use and emissions, 2005 and 2010

Emissions Sector	Source	2005 Energy Use Data	2010 Energy Use Data	Increase or Decrease in Energy Use	2005 Emissions (in $MTCO_2e$)	2010 Emissions (in $MTCO_2e$)	Increase or Decrease in Emissions (in $MTCO_2e$)
Residential	Electricity (kWh)	8,556,529	9,203,728	+647,199	1,912	1,868	-44
	Natural Gas (therms)	710,229	748,593	+38,364	3,799	3,979	+180
Commercial / Industrial	Electricity (kWh)	58,391,941	58,489,002	+97,061	13,054	11,871	-1,183
	Natural Gas (therms)*	973,605	1,032,324	+58,719	5,207	5,487	+280
	Direct Access Electricity (kWh)	12,200,943	7,810,421	-4,390,523	5,327	2,618	-2,709
Stationary Sources	Multiple Fuels	Not available				2,449	Not available
				TOTAL	29,299	28,273	-1,026

* 2005 Commercial/Industrial Energy Use data and Emissions for natural gas exclude previously-reported Direct Access natural gas. The Direct Access natural gas consumption was erroneously double-counted in the baseline 2005 inventory.

Figure 5: Building Energy Use – Fuel Type



It is important to note that emissions associated with the generation of electricity, which make up a significant portion of the greenhouse gasses associated with building energy, can vary

widely from year to year. The GHG emissions associated with electricity use is based on an emissions factor specific to PG&E's territory and is calculated annually by PG&E and then made available to cities. The source of the emission factor used for the 2005 baseline inventory is the Greenhouse Gas Emission Factors white paper by PG&E.

This factor varies year to year because PG&E's electricity sources change. For instance, the utility specific emissions factor for PG&E in 2006 was 455.81 lbs/MWh, whereas in 2008 it was 641.35 lbs/MWh. For PG&E, the variance is typically dependent on the availability of hydroelectric resources. During low precipitation years, there is less water available to generate emissions-free hydropower. Because of this, PG&E must compensate by supplying more electricity—most of which is now generated from natural gas or coal. The proportion generated from renewable energy will increase in the future as a result of the California Renewable Portfolio Standard.

http://latimesblogs.latimes.com/.a/6a00d8341c630a53ef014e8744ae6a970d-pi

For the 2005 baseline inventory, the 2005 emissions factor was used. For future inventories, a three-year average emissions factor may be considered to address the potential large variance from year to year.

2.2.2 Transportation Emissions

As with many Bay Area cities, vehicle travel in Brisbane is the largest single source of GHG emissions. Most methods for estimating transportation emissions are based on vehicle miles traveled (VMT). Community-wide VMT estimates are highly dependent on the accounting rules and analytical tools used. Two general approaches are allowed in the Community GHG Protocol; the in-boundary method, in which all VMT within the limits of the jurisdiction are included; and the origin-destination method, in which trips are allocated to each jurisdiction based on whether they started or ended in the jurisdiction. Notably, the in-boundary method includes "pass-through" traffic, or trips that do not start or end in the jurisdiction, but the origin-destination method does not include these trips. Trips that start and end within the jurisdiction are included in both methods.

The origin/destination method of calculating GHG emissions was used. In 2005, the GHG emission quantity for transportation was 35,952 MT CO_2 e, and the business as usual projection for 2020 was 36,804 MT CO_2 e.

To achieve the target of 15% below 2005 baseline emissions by 2020, Brisbane will have to reduce emissions by 13,876 MT CO_2 e. The origin/destination method allows for inclusion of state policies that would assist in achieving Brisbane's reduction goal by reducing GHG emissions by 12,867 MT CO_2 e. The remaining 1,009 MT CO_2e emissions to reduce will be covered by locally applied measures found in Chapter 3 of this plan.

The three statewide initiatives that assist in reducing GHG emissions include:

Assembly Bill 1493, the Pavley Bill. In 2002, the California legislature enacted Assembly Bill (AB) 1493 (aka "the Pavley Bill"), which directs the Air Resources Board to adopt standards that will achieve "the maximum feasible and cost-effective reduction of greenhouse gas emissions from motor vehicles," taking into account environmental, social, technological, and economic factors. In September 2009, the Air Resources Board adopted amendments to the "Pavley" regulations to reduce GHG emissions in new passenger vehicles from 2009 through 2016.

Low Carbon Fuel Standard (LCFS). Fuel carbon intensity, defined as the amount of carbon per gallon, is addressed by the State of California's Low Carbon Fuel Standard, which mandates that a 10 percent overall reduction in the carbon intensity of transportation fuels (gasoline, diesel, natural gas, electricity, and so on) be achieved by 2020.

California 33 Percent Renewable Portfolio Standard (RPS). California's Renewable Portfolio Standard (RPS) was originally established by legislation enacted in 2002. Subsequent amendments to the law have resulted in a requirement for California's electric utilities to have 33 percent of their retail sales sourced from eligible renewable resources in 2020 and all subsequent years. Renewable resources include wind, solar, geothermal, wave, and small hydroelectric power.

It should be noted that proposed Senate Bill 350, named the Clean Energy and Pollution Reduction Act of 2015, or nicknamed the Golden State Standard 50-50-50, proposes the three goals by year 2030: to increase the RPS to 50%, to reduce petroleum use by 50%, and to increase energy efficiency in buildings by 50%.[36]

Besides the three statewide and the additional local sustainable street measures, this plan will not cover GHG emissions from land use and other transportation issues for which policy is determined by the City of Brisbane's General Plan. Additionally, the Baylands Sustainability Framework adopted by the City Council will address land use issues and transportation for that development using the10 One Planet Living principles as a guide and could serve as a model for any other future proposed development.

[36] http://focus.senate.ca.gov/sites/focus.senate.ca.gov/files/climate/505050.html

Table 2.3 Origin-Destination Emissions Reductions Attributed to State policies in 2020

State Initiative	Sector	BAU Sector Emissions	% Reduction in BAU Sector Emissions	MT CO2e Avoided Resulting from State Initiative
AB 1493 (Pavley)	Transportation	36,804	19.7%	7,250
LCFS	Transportation	36,804	7.2%	2,650
33% RPS	Electricity (Energy)	17,351	17%	2,967
TOTAL				**12,867**

2.2.3 Solid Waste

Emissions from waste result from organic materials decomposing in the anaerobic environment of a landfill that produces methane—a GHG 21 times more potent than carbon dioxide. Organic materials (e.g., paper, plant debris, food waste, and so forth) generate methane within the anaerobic environment of a landfill while non-organic materials do not (e.g., metal, glass, and so on).

http://www.recologysanmateo.com/files/RecologySanMateoCounty/RSMC_RecyclePoster_8.5x11

Table 3 shows the approximate breakdown of the materials Brisbane sent to the landfills in 2005. Materials that do not release GHGs as they decompose are included in the "All Other Waste" category. 3.1 shows the GHG emissions from generated waste in 2005 and 2010. The 2005 GHG inventory completed by ICLEI used a method for breaking down waste emissions by waste type that is significantly different from the U.S. Community Protocol method used to complete the 2010 GHG inventory. For this reason, the breakdown by waste type for 2010 doesn't provide a useful comparison to the breakdown by waste type for 2005.

Table 3: Assumed Waste Composition[37]

Waste Type	GHG emissions (MT CO_2e)	Waste Share
Paper Products	813	54.8%
Food Waste	320	21.6%
Plant Debris	85	5.7%
Wood/Textiles	239	16.1%
All Other Waste	0	0
Landfill cover- Plant debris	26	1.8%
Total	**1,483**	**100%**

Table 3.1: Generated waste data and emissions, 2005 and 2010

Emissions Sector	2005 Waste Amount (tons)	2010 Waste Amount (tons)	Increase or Decrease in Waste Amount (tons)	2005 Emissions (in $MTCO_2e$)	2010 Emissions (in $MTCO_2e$)	Increase or Decrease in Emissions (in $MTCO_2e$)
Disposed waste	7,981	5,497	-2,484	1,457	855	-373
Alternative Daily Cover	1,286	972	-314	26	228	+1,286
TOTAL:	9,267	6,469	-2,798	1,483	1,084	-399

2.2.4 Municipal Operations

Sources of emissions from municipal operations are primarily facilities that house employees and the transportation and equipment required for those employees to perform city services.

[37] Waste characterization: CIWMB 2004 Statewide Waste Characterization Study. This state average waste characterization accounts for residential, commercial and self-haul waste. http://www.ciwmb.ca.gov/Publications/default.asp?pubid=1097

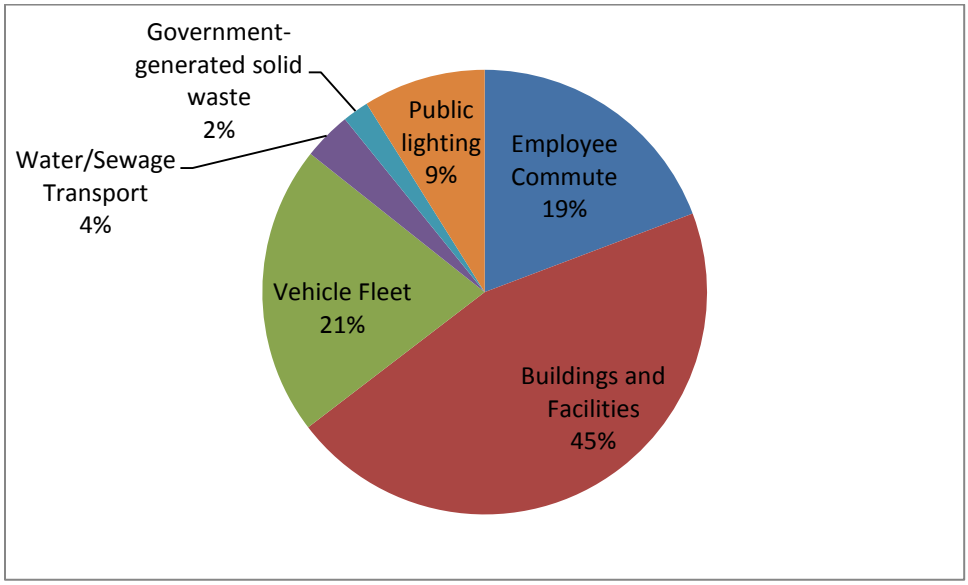
Table 4: 2005 Brisbane Government Operations Emissions by Sector

Sector	GHG Emissions (metric tons CO_2e)
Employee Commute	242
Buildings and Facilities	570
Vehicle Fleet	265
Water/Sewage Transport	44
Government-generated solid waste	24
Public lighting	112
TOTAL	**1,256**

Table 4.1: 2010 Brisbane Government Operations Emissions by Sector

Sector	GHG Emissions (metric tons CO_2e)
Buildings and Facilities	422.97
Vehicle Fleet	239.51
Employee Commute	214.60
Public Lighting	89.86
Water/Sewage Transport	41.91
Government-Generated Solid Waste	12.75
Totals	**1,021.60**

Figure 7: Municipal Operations – Greenhouse Gas Emissions



2.2.5 Emissions Forecast for 2020 and 2035

Based on the 2005 community and municipal operations emissions inventories, the City of Brisbane projected a forecast of future emissions for the year 2020. The emission forecast represents a "business-as-usual" prediction of how GHG emissions would grow in the absence of a GHG policy. Conducting an emissions forecast is essential for developing the climate action plan, because one must compare future reductions with future emissions levels, not current levels.

The projected business-as-usual GHG emissions are based on the emissions from the existing growth pattern and General Plan prior to the adoption of this climate action plan. More specifically, business-as-usual emissions would occur if the City of Brisbane were to continue its 2005 patterns of travel, energy and water consumption, and waste generation and disposal. Therefore, the business-as-usual emissions are projected in the absence of any mitigation measures, policies or actions that would reduce emissions over time, including landmark state legislation described in section 1.4. Programs, policies, and measures implemented after 2005 are considered beyond business-as-usual. The projections from the baseline year of 2005 uses growth factors specific to each of the different economic sectors. Table 5 and 7 below summarize the results of the forecast.

Table 5: Brisbane "Business as Usual" Emissions Forecast for 2020

Emissions Sources	2005 ($MTCO_2$)	2010 ($MTCO_2$)	(Projected) 2020 ($MTCO_2$)	Annual Growth Rate (2010 to 2020)	Percent change from 2005 to 2020
Residential	5,711	5,847	5,969	0.21%	4.5%
Commercial/Industrial	23,588	22,425	23,903	0.64%	1.3%
Transportation	35,952	33,173	36,804	1.04%	2.4%
Generated Waste	5,695	7,267	7,418	0.21%	30.3%
Water	N/A	82	86	0.42%	N/A
TOTAL	**70,946**	**68,794**	**74,180**	**0.76%**	**4.6%**

The emissions forecast for each sector were projected because specific factors affect each sector differently (e.g. new building energy codes or new fuel economy standards for vehicles). This approach provides a better approximation of future emissions. The following points explain how the emissions forecast was estimated for each sector:

- For the residential energy sector, a compounded annual population growth rate of 0.21 percent was calculated using population projections from the Association of Bay Area Governments (ABAG).

- For the commercial energy sector, the City of Brisbane relied on the analysis contained within "California Energy Demand 2008-2018: Staff Revised Forecast,"[38] a report by the California Energy Commission (CEC), which shows that commercial floor space and the number of jobs have closely tracked the growth in energy use in the commercial sector. Using regional job projections for the San Francisco Bay Area from ABAG's *Projections 2009,*[39] it was calculated that the compounded annual growth in energy use in the commercial sector is 0.64 percent.

- For transportation, the City of Brisbane relied on "Transportation 2035 Plan for the San Francisco Bay Area" from the Metropolitan Planning Commission, which projects VMT in 2020. This prediction is used to calculate an annual rate of 1.044 percent per year through 2020.[40] The recently passed federal Corporate Average Fuel Economy standards and the State of California's pending tailpipe emission standards could

[38] http://www.energy.ca.gov/2007publications/CEC-200-2007-015/CEC-200-2007-015-SF2.PDF
[39] http://www.abag.ca.gov/planning/currentfcst/regional.html#
[40] Report available at: http://www.mtc.ca.gov/planning/2035_plan/Supplementary/T2035-Travel_Forecast_Data_Summary.pdf

significantly reduce the demand for transportation fuel in the City of Brisbane. An analysis of potential fuel savings from these measures has not been included in this business-as-usual forecast. Regardless of future changes in the composition of vehicles on the road as a result of State or federal rulemaking, emissions from the transportation sector will continue to be largely determined by growth in VMT.

- For waste and wastewater-related emissions growth, the primary determinate for growth in emissions for the waste sector is population. Therefore, the compounded annual population growth rate of 0.21 percent (the same as the residential sector projection) was used to estimate future emissions in the waste and wastewater sector.

- The annual growth rates for the residential and commercial/industrial sectors was averaged together to find the annual growth rate for water use of 0.42 percent.

2.3 Emission Reduction Targets

The *California AB 32 Scoping Plan* seeks to bring California to a low carbon future, reaching 1990 emissions levels by 2020. As part of that reduction, the plan asks municipal governments to reduce their emissions by at least 15 percent by 2020 compared with current levels (current levels are defined as 2008 levels or earlier). The plan also directs local governments to assist the state in meeting California's emissions goals. Many cities have consequently adopted community-wide emissions reduction targets at least 15 percent below 2005 levels by 2020, while some cities in the Bay Area have sought even stricter emissions targets.

http://myfriendsandiniles.blogspot.com/2012_07_01_archive.html

This climate action plan summarizes the actions that City of Brisbane is planning to take to reduce emissions within our community.

2.3.1 Reductions from State-Level Actions

In addition to the actions outlined here, regulations aimed at reducing GHG emissions at the state and regional levels will also contribute to emissions reductions in Brisbane. For example, the California Renewable Portfolio Standard (RPS) mandates that 33 percent of electricity sold by the State's investor-owned utilities be generated from renewable resources by 2020. These actions were summarized in Section 1.4 of this report. The impact of state-level actions on reducing local emissions is significant, and is shown in relation to the City of Brisbane's emissions baseline, business-as-usual forecast, and reduction target in Figure 7.

A summary of the expected emission reductions from state programs is provided in Table 6 below.

Table 6: Total Emission Reductions from State of California Programs

State Initiative	Sector	% Reduction from 2020 GHG Inventory	Reduction in City's Emissions (MT CO_2e)
AB 1493 (Pavley)	Transportation	19.7%	7,250
LCFS	Transportation	7.2%	2,650
33% RPS	Electricity (Energy)	17%	2,967
A. Total Statewide Initiative Emissions Reductions			12,867

2.3.2 The City of Brisbane Reduction Target

Reduction targets were selected based upon measures identified in the CAP as both a priority for the city and as being attainable. City measures will need to reduce GHG emissions by 1,009 MT CO_2e beyond the emissions reductions from state measures. One thousand nine (1,009) MT CO_2 equates to the annual GHG emissions from 212 passenger vehicles or the CO_2 emissions from 92.1 homes over one year.

The City of Brisbane is committing to reducing community-wide greenhouse gas emissions by at least 15 percent by 2020, 15% being a reduction of 13,876 metric tons of carbon dioxide equivalent.

Figure 7 below illustrates how the business-as-usual emissions are estimated to increase, thus widening the emissions reductions needed by 2020. Figure 7 also shows the emissions reductions expected from State-Level actions, and the reductions needed to reach the City of Brisbane's emission target. The baseline emissions, forecasted emissions, targeted emissions, and emissions reduction needed to reach the target are shown in Table 7.

Reduction targets were based upon compliance with AB 32. AB 32 requires the state of California to reduce greenhouse gas emissions to 1990 levels by 2020, which equates to 15% below a business as usual scenario. Brisbane hopes to exceed that reduction amount.

Figure 7. Brisbane GHG Reduction Target (15% below 2005 levels by 2020)

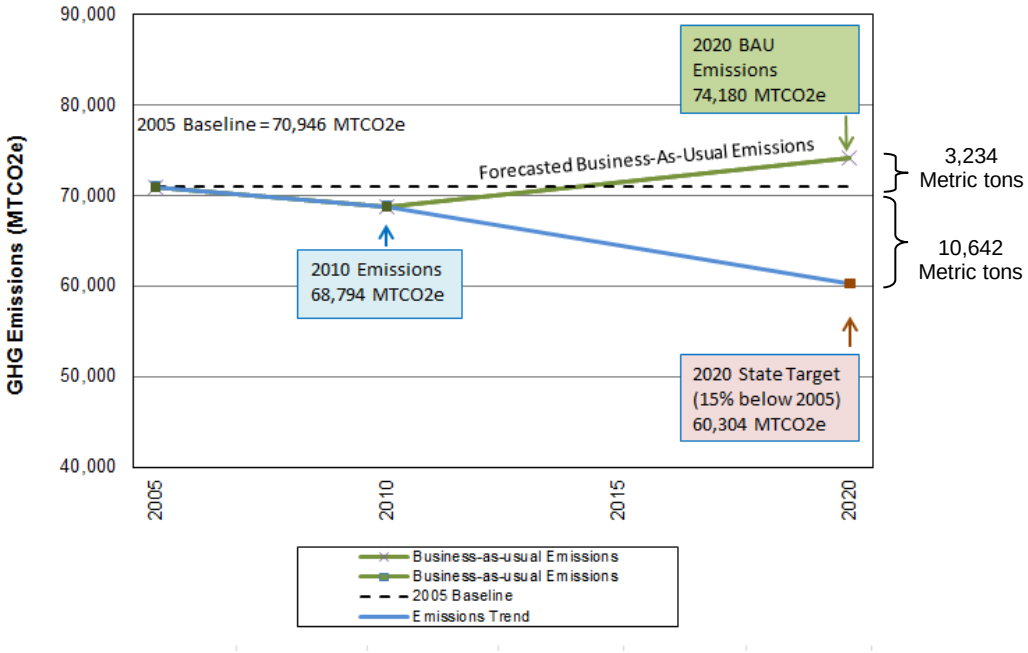


Table 7: GHG Emissions Projection and Reduction Target

*2005 Emissions ($MTCO_2e$)	**2010 Emissions ($MTCO_2e$)	2020 BAU Emissions ($MTCO_2e$)	2020 Target Emissions at 15% below 2005 ($MTCO_2e$)	Emissions Reductions Required ($MTCO_2e$)
70,946	68,794	74,180	60,304	13,876

* Total 2005 baseline emissions exclude previously-reported Direct Access natural gas. The Direct Access natural gas consumption was erroneously double-counted in the baseline 2005 inventory.

**Some reduction in GHG emissions is due to the economic downturn in 2008.

3 Climate Action Strategies

This climate action plan is the beginning of a journey towards a more sustainable Brisbane. In these pages, the citizens of Brisbane will find policies and programs that aim to reduce emissions, save energy (and money), and help Brisbane continue to be a desirable and healthy place to live, work, and play as time goes on.

By adopting this climate action plan, the City is committing to take action to reduce GHG emissions. The Plan provides a prioritized list of actions, each of which should be further developed, studied, and vetted independently before being implemented. The programs and policies described give Brisbane a viable path towards reducing emissions that, combined with emissions reductions resulting from State and regional policies, will meet the emissions reduction goals established in AB 32.

The previous chapters presented steps 1 and 2 in the Framework for Climate Action (see section 1.7.1), the emissions inventory of Brisbane and the community emissions reduction target. The following sections represent Step 3: the Climate Action Plan.

Each section below outlines the specific actions, which we call "measures," that seek to reduce GHG emissions from Brisbane. For method of measure selection and prioritization for action, see Section 5.1. Some measures aim to reduce emissions from the community at large, while other measures may specifically focus on the operations of the City of Brisbane. Also, all measures are assumed to lead to specific, quantifiable reduction of GHG emissions, except for the more general supporting measures described in Section 4, Measures requiring further study.

3.1 Energy

In the United States, buildings account for 70 percent of total electricity use and about 40 percent of GHG emissions.[41] The State of California has long been a leader in implementing policies aimed at improving the energy efficiency of its building stock. The state is committed to first meet its energy needs "through all available energy efficiency and demand reduction resources that are cost effective, reliable and feasible."[42]

[41] Fuller *et al.* 2009. *Toward a Low-Carbon Economy: Municipal Financing for Energy Efficiency and Solar Power*. Environment Magazine

[42] "Energy Action Plan I", California Energy Commission, California Public Utilities Commission and Consumer Power and Conservation Financing Authority. May 8, 2003. Available at: http://docs.cpuc.ca.gov/word_pdf/REPORT/28715.pdf

Since the 1970s, California has led the nation in developing and implementing successful energy-efficiency efforts. The California Energy Efficiency Standards for Residential and Nonresidential Buildings (Title 24, Part 6 of the California Code of Regulations) mandates minimum levels of energy efficiency in both new construction and renovation projects. These requirements were updated in 2013 to further increase building and appliance energy efficiency. California has also set targets for "zero net-energy" new buildings, in which efficiency and on-site generation are combined to reduce residential buildings to zero net-energy use by 2020 and commercial buildings by 2030.[43]

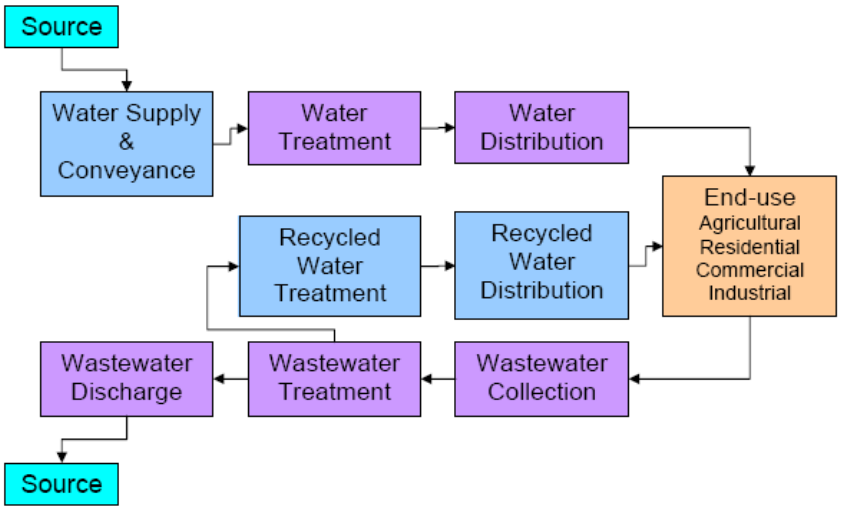
Building energy is the sector with the most immediately achievable and affordable reduction opportunities. Energy efficiency is the most cost-effective measure for GHG reductions and also has numerous co-benefits such as cost savings over time and promotion of green collar jobs. Design and construction of new buildings, or major renovations of existing ones, provides an opportunity to implement energy-saving measures that reduce GHG emissions. Generous utility rebates and federal tax incentives make investing in energy efficiency increasingly attractive. Along with energy efficiency, California has a long history of supporting renewable energy generation. With the idea of "reduce, then produce," a sensible energy policy seeks to first maximize energy efficiency and then look to generate electricity with low-carbon fuels and renewable resources.

http://koin.com/2015/06/22/2000-pge-customers-lose-power/

Energy and water use are linked. Energy is needed to transport and to treat water so that it is safe for public consumption. Energy is also used to treat wastewater so that it can be discharged back to the environment. The following diagram demonstrates California's water use cycle.

[43] California Energy Commission, *2007 Integrated Energy Policy Report*, CEC-100-2007-008-CMF

Figure 8: California's Water Use Cycle



Graphic: California Energy Commission

Energy is used in each step of the process. Water is collected, treated, and distributed to end users in farms, residences, businesses, and industries. Energy, usually natural gas, is used to heat water for use in buildings. Then energy is needed to treat water for discharge back to the environment. Nineteen percent of the state's electricity and 32 percent of the state's natural gas is consumed during this cycle.[44] Fifty eight percent of the electricity and 98.5 percent of the natural gas consumption stems from just the residential, business, and industrial end users.

Reducing water consumption through efficiency and conservation can make a big impact on energy consumption as well as protect against drought, a common problem in California. Water Conservation Senate Bill X7-7 was enacted in November 2009, requiring all water suppliers to increase water use efficiency. The legislation sets an overall goal of reducing per capita urban water use by 20 percent by December 31, 2020. The California State Integrated Water Management Planning Process promotes bringing together and prioritizing water-related efforts in a systematic way to ensure sustainable water uses and reliable water supplies.

In this chapter, we propose City programs and initiatives that will promote energy and water efficiency as well as renewable energy in both existing and new buildings.

[44] California Energy Commission 2005. *California's Water-Energy Relationship.*

3.1.1 Energy Measures

Community-wide Measures

A. Community Choice Aggregation/Energy (GHG savings - 1,407 Annual MT CO_2e)

- Enabled by California legislation (AB117), Community Choice Aggregation/Energy (CCA/E) allows local governments to purchase and generate power to sell to residential and business customers. Energy transmission, distribution, repair and customer service remain the responsibility of PG&E. The City is currently participating in the Community Choice Energy (CCE) Advisory Committee for San Mateo County, which is studying the feasibility of a CCE in San Mateo County. If determined to be feasible, a Joint Powers Authority may be formed and would then consist of participating local agencies from among the 20 cities and San Mateo County.
- A CCA/E will likely offer 50% and up to 100% renewable energy options to fulfill energy needs.

B. Participate in Energy Upgrade Program and similar residential rebate/incentive programs as they become available, and promote existing rebates (PG&E, State, Federal) (GHG savings - 72 Annual MT CO_2e)

Brisbane will encourage residents to reduce energy use through various incentive programs:

- Energy audits and the implementation of recommendations identified by audits
- Promotion of financing for energy upgrades
- Promote existing solar hot water rebates/tax credits and streamline solar permitting per AB 2188.
- Provide a DIY Energy Toolkit available for checkout through the library.
- Request residents utilize CaliforniaFIRST financing for home upgrades (PACE and others)
- Continue to promote Peninsula SunShares program for bulk purchase of PV solar systems for homes.
- Arrange implementing door-to-door information/ education about energy savings programs. Possibly for community volunteer hours.
- Provide access to easily display energy saving programs on the web, linked to the City's website, that have been vetted by San Mateo County Energy Watch or another appropriate agency.

C. Residential Green Building Ordinance (GHG savings - 8 Annual MT CO_2e)

- The Green Building ordinance (GBO) was adopted in 2007 requiring new residential dwellings in developments with over 20 housing units to achieve a "green home" rating on the New Home Green Points Checklist/ Build it Green. Note: the GBO was adopted before roll out of new CalGreen Title 24 codes[45]. The 2013 edition of the California Building Standards Code (Title 24) became effective in July, 2014, and requires increased energy efficiency in lighting, HVAC ducts, wall insulation and windows to name a few. Future projects will be held to both Title 24 codes and the Green Building Ordinance.

[45] http://www.ecodes.biz/ecodes_support/Free_Resources/2013California/13Green/13Green_main.html

D. Promote PG&E commercial and industrial energy efficiency/demand response programs (GHG savings - 541 Annual MT CO_2e)

- City will promote commercial energy audits and encourage the implementation of recommendations identified by audits, such as the free small business energy audits provided by San Mateo County Energy Watch, and will promote existing energy efficiency financing options. The City will work with the County towards making energy audits mandatory.
- The City will take action to reduce commercial exterior lighting at night.
- The City will request planting of appropriate trees in commercial parking lots.
- The City will also comply with the state's Nonresidential Building Use Disclosure Program AB1103 requiring disclosure of energy use to prospective buyers of buildings sized at 10,000 square feet or above.
- The City will also promote existing solar hot water rebates/tax credits.
- Staff will draft legislation for Council consideration requiring that all buildings be recommissioned when changing ownership or undergoing major renovation[46].

E. Commercial green building ordinance (GHG savings - 4 Annual MT CO_2e)

- City of Brisbane has adopted a Green Building Ordinance (GBO) that applies to commercial buildings of 10,000 square feet or more which requires them to achieve a LEED silver rating. Note: the GBO was adopted before roll out of new CalGreen Title 24 codes[47]. The 2013 edition of the California Building Standards Code (Title 24) became effective in July 2014, and requires buildings to be solar ready, perform building envelope improvements and commissioning of buildings as well as requirements similar to those for residential structures related to lighting, HVAC, windows and insulation, etc. Future projects will be held to both Title 24 codes and the Green Building Ordinance.

F. Voluntary Residential Energy disclosure (GHG savings - 42 Annual MT CO_2e)

- Provide for voluntary disclosure of energy use information (e.g. utility bill) of a building or home at time of sale.
- Pursue a Residential Energy Conservation Ordinance (RECO) that would require certain energy upgrades to be installed prior to sale of residential buildings and potentially prior to new leases being signed for residential buildings. The seller and buyer would negotiate who performs upgrades. If this ordinance is not adopted at the city level, partnership with the county for adoption should be pursued.

G. Banning gas-powered lawn equipment (GHG savings - 43 Annual MT CO_2e)

- Gas powered lawn equipment would be phased out and replaced with electric powered lawn equipment when feasible. Advise users of lawn equipment to purchase electric over gas-powered. Potentially adopt an ordinance to ban gas powered lawn equipment. Potentially phased in by commercial first then residential.

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[46] Commissioning is a performance review of buildings' energy-using systems. It can locate problems like simultaneous heating and cooling, which are (unfortunately) common. See "Building Commissioning": The Stealth Energy Efficiency Strategy, at *Climate Progress* (8/12/2009) here: http://thinkprogress.org/climate/2009/08/12/204471/building-commissioning-energy-efficiency-lbnl-evan-mills/

[47] http://www.ecodes.biz/ecodes_support/Free_Resources/2013California/13Green/13Green_main.html

Municipal Measures

A. Enroll in an offset program (GHG savings - 207 Annual MT CO_2e)

- The City will request either participation in the CCE program with the purchase of 100% renewable energy or enrollment in an energy offset program to offset city GHG emissions from electricity and natural gas. The offsets will be State of California approved.

B. Environmentally preferred purchasing policy- Energy (GHG savings - 4 Annual MT CO_2e)

- The City will adopt an Environmental Procurement Policy (EPP) that emphasizes recycled materials and energy efficient equipment. The EPP will be modeled after San Mateo County's policy.[48] (The city's adopted Climate Friendly Purchasing Guide is attached as Appendix H)

C. Energy efficient street lighting (GHG savings - 32 Annual MT CO_2e)

- The City will continue to replace existing street lights with LEDs.

D. Renewable energy installation on municipal property (GHG savings - 65 Annual MT CO_2e)

- The City intends to install solar PV on City Hall and explore the potential for solar PV at other city facilities**.**

E. Energy efficiency in municipal buildings (GHG savings - 13 Annual MT CO_2e)

- The City will continue to audit city facilities for energy efficiency opportunities and implement energy efficient retrofits.
- The City participates in San Mateo County Energy Watch programs that assist with energy efficiency upgrades and also tracks energy performance through benchmarking.

3.2 Water Use

In January 2015, according to the California State Water Board, the average water use per person per day in California was 72.6 gallons.[49] Brisbane's per capita use has generally been much lower. In the billing cycle of mid-December 2014 to mid-February 2015, the average gallons per person per day used was 42. In the most recent billing cycle of mid-April to mid-June 2015, the gallon per person per day use was 39. Although these residential reductions are

[48] San Mateo County's Environmental Procurement Policy
http://green.smcgov.org/sites/green.smcgov.org/files/Environmental_Procurement_Policy.pdf

[49] California Water Boards Media Release. March 3rd, 2015
http://www.waterboards.ca.gov/press_room/press_releases/2015/pr030315_urbanwater.pdf

notable, Brisbane has made targeted efforts in additionally reducing outdoor irrigation. Significant reductions have been achieved in a short amount of time after implementing a two day a week outdoor irrigation schedule and providing landscape water audits to the highest users. The storage and transmission of water and wastewater is a significant source of energy use, thus water is an important element of the CAP.

3.2.1 Water measures

A. Water conservation incentives (GHG savings - 24 Annual MT CO_2e)

- The City adopted the Brisbane Indoor Water Conservation and Water Conservation in Landscaping Ordinances in 2010 and will continue to apply the ordinances.
- The City will continue to promote existing and/or new rebates for water efficient appliances and fixtures through BAWSCA and promote CaliforniaFIRST water efficiency project financing for drip irrigation systems.
- The City will promote information/programs for water efficient landscaping and consider providing incentives for drought-resistant plants to reduce total water footprint.

3.3 Solid Waste

While it may not be immediately obvious, reducing the amount of waste deposited into the landfill through material reuse, reduction, and recycling is an important action Brisbane residents can take to reduce GHG emissions.

Landfills capture as much methane as possible and combust it, in some cases for electricity generation. However, for many landfills, some methane leaks to the atmosphere. This methane leakage is one source of Brisbane's GHG emissions in the waste category.

To address the issues of escalating waste production, California AB 939 was passed in 1989, which mandated local jurisdictions to meet a solid waste diversion goal of 50 percent by the year 2000. Each jurisdiction was required to create an Integrated Waste Management Plan that looked at recycling programs, purchasing of recycled products and waste minimization. These plans form the foundation of the waste programs in place today. Greenhouse gas emissions are also associated with product supply chains. Upstream from the consumer, fossil fuel energy is used to extract the raw materials, such as wood, metals, and so forth, from which products are made.

Additional energy is needed to manufacture consumer goods in factories. Petroleum is used for the transportation of raw materials to the factory, moving manufactured goods to market, and moving waste from the consumer's curbside to landfills. These emissions do not show up in Brisbane's inventory; however, it is important to be aware of them. As consumers, we each

have a responsibility to support products that reduce waste and encourage manufacturers to design environmentally-friendly products.

Waste reduction and recycling are powerful tools for reducing emissions all along the consumed materials' lifecycle. Reducing the amount of materials required through re-use— for example using canvas bags instead of plastic and paper bags from the grocery store—represents the best opportunity to reduce GHG emissions in a significant way. Brisbane adopted a plastic bag ban in March 2013; the ordinance was modeled after San Mateo County's ban, and is enforced by the county. Brisbane adopted a Polystyrene, aka Styrofoam, ban in November 2014; the ordinance was also modeled after San Mateo County's ban, and is enforced by the county.

Recycling represents the second best opportunity to reduce GHG emissions. For these materials, recycling reduces energy-related carbon dioxide emissions in the manufacturing process and avoids emissions from waste management.

3.3.1 Solid waste measures

Community-wide Measures

A. Set higher diversion rate goal (GHG savings - 605 Annual MT CO_2e)

- The City will promote residential waste reduction and continue offering food scrap pickup through South San Francisco Scavenger.
- The City will encourage community exchange of used items and/or more frequent community garage sales than the current one per year citywide Friends of the Brisbane Library sponsored garage sale. In addition to exchange of items, the City will educate and encourage residents regarding recycling of household items and textiles. The City will investigate offering days specific to waste type pick up or offering public bins.
- South San Francisco Scavenger plans to augment its existing organics service by adding food scrap pick up to existing yard waste pick up for businesses, including City Hall, in 2016.

B. Commercial recycling ordinance (GHG savings – N/A Annual MT CO_2e)

- The City will continue to support required commercial recycling, and City staff together with waste management staff will verify compliance.

C. Create sustainable vendor policy at public events (GHG savings - N/A Annual MT CO_2e)

- The City will encourage residents to bring reusable plates, cutlery and cups to public events. The City will investigate the use of a waste attendant to promote proper recycling and composting. The waste attendant would be staff or a volunteer that guides community members to throw away their waste properly in each bin.

D. Yard waste ordinance (GHG savings - N/A Annual MT CO_2e)

- The City will adopt an ordinance requiring that all landscapers and landscape maintenance businesses recycle/divert yard waste. A permitting system with an enforcement component will be investigated to insure yard waste is property disposed of.

Municipal measures

A. Environmentally preferred purchasing policy (GHG savings - N/A Annual MT CO_2e)

- Implement a Climate Friendly purchasing policy that will serve as a guide for the city to purchase office products and services. (This measure is listed and its GHG savings quantified in the Energy measures section, but it is mentioned here to reinforce the City's intent to reduce its municipal waste stream. The City's adopted Climate Friendly Purchasing Guide is located in Appendix H)

B. Achieve 95% diversion of municipal waste (GHG savings - 10 Annual MT CO_2e)

- Investigate feasibility and cost of achieving predominantly paperless city operations. City will compost and follow zero waste practices.

3.4 Road emissions/Transportation

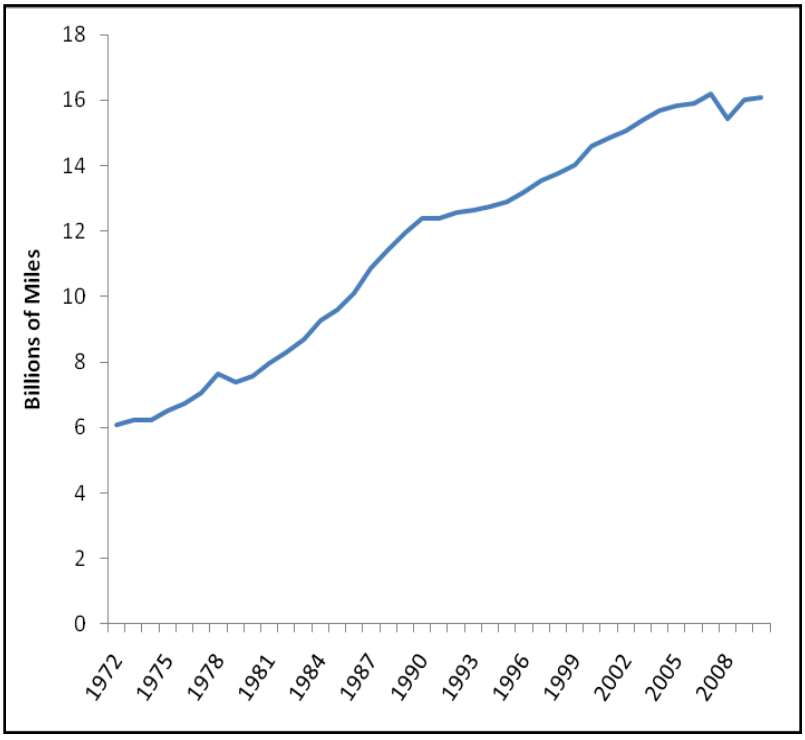
Thirty-eight percent of the California's GHG emissions stem from transportation — the cars and trucks that move people and goods throughout the state. In Brisbane, 76 percent of emissions stem from transportation.

Transportation- Emissions by sector (%)	
State Highways	59%
Local Roads	13%
Off-Road Equipment	4%
Total	**76%**

Thus, reducing transportation emissions is a critical component of the climate action strategy. Reducing emissions from the transportation sector requires addressing three constituent components: reducing the carbon intensity of fuels, increasing vehicle efficiency, and reducing vehicle miles travelled (VMT). Fuel carbon intensity, defined as the amount of carbon per gallon, is addressed by the State of California's Low Carbon Fuel Standard, which mandates a 10 percent overall reduction in the carbon intensity of transportation fuels (gasoline, diesel, natural gas, electricity, and so on) by 2020. Vehicle efficiency is addressed by AB 1493, California's Clean Cars Law of 2002, which requires car manufacturers to reduce global-warming emissions from new passenger cars and light trucks beginning in 2009. First in the world to reduce global-warming pollution from cars, this law has now been adopted by 11 other states. Affecting nearly one-third of the U.S. market, this law is projected to reduce global-

warming emissions in 2020 by 64 million tons per year. However, addressing the third component, reducing VMT, is considerably more difficult than the previous two. Californians have driven more and more miles per year over the past five decades. Figure 9 shows the growth in VMT from 1972 – 2010.

Figure 9: California Growth in Vehicle Miles Travelled (VMT)
July of each year, 1972-2010



Data: California Department of Transportation

This growth in VMT is attributable in part to the following factors:

- Growth in gross domestic product
- Lack of affordability in urban core housing causes people to live far away from where they work
- Lack of viable public transportation options
- Low cost of gasoline
- Sprawl development patterns such as bedroom communities separated from retail and commercial centers
- Streetscapes that discourage pedestrian or bicycle access
- The development and promotion of an American “car culture”

In order to reduce VMT and the associated GHG emissions, Governor Schwarzenegger signed Senate Bill 375 in 2008. SB 375 sets regional emissions targets and tasks regional planning organizations to recalibrate land use and transportation planning to meet those emissions targets. The SB 375 targets for the San Francisco Bay Area are 7 percent below 2005 levels by 2020 and 15 percent below 2005 levels by 2035. This climate action plan seeks to exceed the 2020 target.

Brisbane is fully committed to providing diverse transportation options that are convenient, safe, and affordable. Policies proposed in this climate action plan strive to maintain a quality of life that is environmentally and economically sustainable. These priorities and commitments are reflected and incorporated in this chapter on road emissions and transportation.

3.4.1 Road emissions/Transportation measures

Community-wide Measures

A. Public EV charging (GHG savings - N/A Annual MT CO_2e)

- The City will install public EV charging stations and consider designating preferred parking for electric vehicles.
- Educate the public about existing transit options.
- Continue to publicize ZipCar for residents to use.

Municipal Measures

A. Adoption of low emissions government vehicles (GHG savings - 14 Annual MT CO_2e)

- Target purchase of new or conversion of existing government vehicles to more fuel efficient vehicles and vehicles with lower or zero emissions (as indicated in the Climate Friendly Purchasing Guide in Appendix H).

3.5 All Sectors

3.5.1 All Sector measures

A. Participate in County Green Business program (GHG savings - 81 Annual MT CO_2e)

- Promote San Mateo County Green Business program, in which Brisbane is a participant. (Voluntary program that allows businesses to brand themselves as green by following sustainable practices)

3.6 Adaptation

The climate is changing rapidly, according to the World Meteorological Organization, in their news release "2000-2009, The Warmest Decade."[50]

> *The decade of the 2000s (2000–2009) was warmer than the decade spanning the 1990s (1990–1999), which in turn was warmer than the 1980s (1980–1989)… The 2000 – 2009 decade will be the warmest on record, with its average global surface temperature about 0.96 degree F above the 20th century average.* ***This will easily surpass the 1990s value of 0.65 degree F.***

Even if we stopped emitting GHGs tomorrow, the climate would still continue to change due to the length of the carbon cycle — the ability of the earth to absorb the excess carbon in the ocean and plants. Therefore, our communities must plan for adaptation to climate change.

Adaptation planning may be most effective at the state and regional levels, due to the scale of resources needed to develop and implement a coordinated plan. The 2009 California Climate Adaptation Strategy[51] was developed to guide California's efforts in adapting to climate change impacts. For more information on adaptation planning, see Appendix D.

4 Measures requiring future study

These goals are longer term and will require further study or investigation to determine feasibility as the plan is updated periodically.

4.1 Energy

A. Investigate district heating: District heating has been implemented throughout Europe and in US locations such as at California Polytechnic State University. The UNEP report[52] describes district heating as sustainable solution to heating and cooling which enables higher shares of renewable energy. This item is also included in a list items for which to consider collaboration with San Mateo County.

B. Investigate ways to promote installation of PV on buildings under commercial leases or carports. Businesses in Crocker Park could potentially form a grid of roof top PV panels. Consider legislation or a program to implement PV for commercial lease holders.

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[50] WMO 2010. *2000–2009, THE WARMEST DECADE* http://www.wmo.int/pages/mediacentre/press_releases/pr_869_en.html

[51] http://www.climatechange.ca.gov/adaptation/

[52] UNEP report- http://unep.org/energy/portals/50177/DES_District_Energy_Report_full_02_d.pdf

Promote installation of PV panels on municipal buildings (such as City Hall and the library) and public school buildings.

C. Investigate tidal power at the lagoon/bay waterway under Highway 101.

D. Investigate harnessing wind power without the use of windmills and use windstalks instead. Windstalks can be more aesthetically appealing (when the wind blows, LEDs light up so the windstalk is visible to birds), they make little to no noise, can contain the infrastructure to store energy and can require less land use compared to windmills.[53]

E. Encourage the heating of a room with a heat grabber or cooling with a swamp cooler.[54]

F. Promote the use of storm windows and/or double glazing.

G. Investigate generating electricity from turbines installed in-line in city water pipes.[55]

H. Consider aspirational goal of use of 90% renewable energy by 2025.

I. Require passive solar design for buildings undergoing major renovation and new construction. Passive solar designs are constructed to collect, store, and distribute solar energy throughout a building in the form of heat in the winter and is rejected during the summer. Designs can be modeled after requirements such as Passivhaus[56]. Investigate with respect to City's existing Green Building Ordinance.

J. Decrease night lighting and light pollution from several sources such as businesses and outdoor recreational facilities. Consider adoption of a light ordinance such as the model lighting ordinance from the Illuminating Engineering Society. [57]

K. Free or subsidized shade tree program for homes. A free shade tree would be provided to applicable homes and the program would potentially be expanded to businesses. Trees will assist to reduce energy needs for buildings. Shade trees should be placed in locations that do not conflict with existing impacted residential parking and species will be taken into consideration.

L. Consider applying the Sustainability Framework for the Baylands to all of the City of Brisbane.

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[53] http://news.discovery.com/tech/alternative-power-sources/windpower-without-blades-101015.htm
[54] http://www.motherearthnews.com/diy/heat-with-a-heat-grabber.aspx
[55] http://magazine.good.is/articles/portland-pipeline-water-turbine-power
[56] http://www.phius.org/home-page
[57] http://www.darksky.org/assets/documents/MLO/MLO_FINAL_June2011.pdf

M. Investigate ways to promote installation of EV charging stations in commercial and municipal parking lots.

N. Explore current zoning regulations to determine feasibility of converting larger homes into duplexes or adding in-law units to reduce the per capita carbon footprint from existing homes.

4.2 Water

A. Consider funding a drought resistant plant giveaway including planting and care instructions from Mission Blue Nursery, incentivizing residents to plant native, drought tolerant, non-invasive plants for their landscaping.

B. Encourage edible gardens over ornamental landscaping where practical. Eating local will decrease the carbon footprint and water footprint of food that is consumed.

C. Determine the feasibility of and demand for implementing gray water systems into residences and businesses in Brisbane in balance with a financially viable public water and sewer system. Adoption of a gray water ordinance can be considered beginning with minimum installation requirements determined by the State California[58]. Greywater and/or recycled water as allowed should be considered for irrigation of municipal landscaped areas.

4.3. Solid waste

A. Encourage community exchange of used items, or items that would otherwise enter the waste stream, through social media sites such as Nextdoor and Facebook, via regular community garage sales, and potentially with a flea market held in conjunction with the farmer's market.

B. Partner with a non-profit like Urban Ore to salvage & resell materials, to the extent that it does not conflict with Brisbane's agreement with our waste management franchisee South San Francisco Scavenger. Urban Ore[59] is a non-profit that assists Berkeley in diverting reusable waste from the landfill and resells those salvaged items to the public.

C. Consider setting policy to achieve 95% diversion of all solid waste by 2020 for municipal facilities.

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[58] http://www.hcd.ca.gov/codes/state-housing-law/preface_et_emergency_graywater.pdf
[59] http://urbanore.com/

D. Establish days when certain materials can be disposed of in community dumpsters such as fabric recycling day, for clothing that is not in the condition to be donated. Cardboard can be reused rather than recycled. To the extent that it does not conflict with Brisbane's agreement with our waste management franchisee South San Francisco Scavenger, develop a cardboard/ box reuse center.

4.4 Road emissions/ transportation

A. Expand the hours that the Brisbane on-call shuttle service is available.

B. Consider encouraging Caltrans to implement algae farms that eat pollution from the highways to reduce the GHG emissions from the highway. [60]

C. Incentivize local businesses and employees to carpool or use public modes of transportation to reduce the GHG emissions from commuting.

D. Investigate titanium dioxide pavement to reduce NO_x emissions. [61] It has been tested and shown that this formulated pavement can reduce NO_x in the air from 25 to 45%, which is then transformed into nitrates.

E. Encourage businesses to hire locally through incentives. The goal being up to 50% of Brisbane's viable workforce working in Brisbane.

F. Incentivize or encourage use of renewable or electric fuels where applicable, such as biodiesel trucks, hybrids, electric vehicles, etc. One example would be to increase truck hauling fees on trucks that do not use biodiesel gas. Investigate partnering with a biodiesel company to create infrastructure for biodiesel vehicles.

4.5 Miscellaneous goals for future study

A. Actively work towards a diverse business community. Currently Brisbane has a significant number of auto body, restaurants and freight forwarding companies. Encourage new businesses that provide services that Brisbane currently lacks, such as a shoe repair shop, movie theater, pharmacy, fitness studio, grocery store, thrift store, etc. A greater mix of local businesses could increase shopping local and decrease the need to drive out of town.

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[60] http://thespiritscience.net/2014/11/03/this-algae-farm-eats-pollution-from-the-highway-below/

[61] http://www.dailytech.com/Titanium+Dioxide+in+Pavement+Could+Dramatically+Reduce+NOx+in+Air/article19003.htm

B. Investigate use of revenues generated by development fees collected due to the public art ordinance to include a perspective on climate change.

C. Encourage incorporation of green walls where applicable. There are several benefits to green walls: increased property values, energy savings, improved aesthetics and the creation of potential corridors for birds and insects

http://www.archiexpo.com/prod/paisajismo-urbano/product-94556-1557822.html?utm_source=ProductDetail&utm_medium=Web&utm_content=SimilarProduct&utm_campaign=CA

4.6 Actively create partnerships with the County to reach these goals:

- Request a San Mateo County Energy Watch Challenge energy audit program for residences such as the existing program for small businesses.
- County adopt a revolving fund program to finance energy efficiency retrofits at residences and businesses.
- Staff to do outreach and be available to answer energy/rebate related questions.
- Determine feasibility and funding of district heating through studies and looking for potential funds.
- Adopt at the county level a Residential energy conservation ordinance (RECO) requiring certain energy upgrades and disclosures upon the sale of a residential property.

- Improve usability of the San Mateo County Energy Watch website that contains rebate information.
- Actively coordinate with and provide feedback to SamTrans to ensure sustained or increased bus service.
- Pass State legislation by 2016 requiring that all buildings be recommissioned when changing ownership or undergoing major renovation.
- Include green home features in the Multiple Listing Services to encourage the sale of green homes.
- Determine feasibility of getting methane mapping done from the Environmental Defense Fund and investigate how to reduce methane from hotspots including natural gas leaks.
- The City will work with the County towards making commercial energy audits mandatory.

5 Implementation

The preceding chapters describe the principal sources of the City of Brisbane GHG emissions and outline related goals and measures for achieving the community's target of reducing emissions to at least 15% below 2005 levels by 2020. This chapter outlines the main components of the process for putting this plan into action and identifies specific actions from earlier chapters that are recommended for implementation.

Although significant GHG reduction policies and initiatives are already in place, the actions proposed in this Plan, by necessity, far surpass the scale of existing efforts. Implementing the Plan and ensuring that it results in real GHG emissions reductions will require increased coordination across sectors and institutionalized climate protection efforts across the community.

There are a large number of measures and programs that Brisbane may implement to reduce GHG emissions. A prioritization methodology is presented below to assist the City in developing a phased implementation plan.

5.1 Prioritizing measures for action

Measures have been selected based on ability to readily implement within a few years. The second criteria for choosing measures were the GHG reductions each would potentially yield. Lastly, some measures were chosen particularly for their direct benefit to the community.

Measures that required future study were placed in Section 4 for further study and analysis.

Implementation of measures will be prioritized based upon and coordinated with the availability of local, county, regional and other funding sources and resources.

5.2 Results of measure prioritization

Summary of Measures

A summary of all the emissions reduction measures is provided in Table 8 below.

Table 8: Summary of Measures

Measure Category	Description of Measure	Emission Reductions ($MTCO_2E$)	Short Term/ Medium Term/ Long Term	Additional Information (Responsible City department or funding strategy)
Energy				
Community	Community Choice Aggregation/Energy	1,407	Medium	Joint Powers Authority, including Brisbane
	Participate in Energy Upgrade programs	72	Short	Public Works
	Residential Green Building Ordinance	8	Medium	Planning
	Commercial Energy efficiency/demand response programs	541	Long	
	Voluntary residential energy disclosure	42	Medium	
	Commercial green building ordinance	4	Short	
	Ban gas powered lawn equipment	43	Medium	
Municipal	Purchase 100% renewable energy and/or enroll in an offset program	207	Medium	
	Environmentally Preferred purchasing policy	4	Medium	

	Energy efficient street lighting	32	Short	Public Works
	Renewable energy installation on municipal property	65	Medium	Public Works
	Energy efficiency in municipal buildings	13	Medium	Public Works
Water use				
Community	Water conservation incentives	24	Short	Public Works
Solid Waste				
Community	Set higher diversion rate goal	605	Medium	
	Commercial recycling ordinance	N/A	Long	
	Sustainable vendor policy	N/A	Medium	
	Yard waste ordinance	N/A	Long	
Municipal	Environmentally friendly purchasing policy	N/A	Medium	
	Establish a zero waste policy (95% diversion)	10	Long	
Sustainable streets/ transportation				

Community	Public EV charging	N/A	Short	Public Works
Municipal	Adoption of low emissions government vehicles	14	Long	Multiple departments
All Sector				
Community	Participate in the Green County Business program	81	Short	

5.3 Meeting the emission targets

Table 9: Meeting the 2020 Target

State Initiative	Sector	% Reduction from 2020 GHG Inventory	Reduction in City's Emissions
AB 1493 (Pavley)	Transportation	19.7%	7,250
LCFS	Transportation	7.2%	2,650
33% RPS	Electricity (Energy)	21%	2,967
A. Total Statewide Initiative Emissions Reductions (ER1 + ER2 + ER3)			12,867
B. Total City Climate Action Plan Reductions Measures			3,172
C. Total Expected Emissions Reductions by 2020 (A+B)			16,039
D. City of Brisbane's Emissions Reduction Requirement for 2020			13,876
E. Meets/exceeds state goals? (C > D)			Yes

5.4 Management of GHG Reduction Strategy

Support will be needed to direct the implementation of the Plan measures. This section details how the city will organize itself to put this plan into action.

- Establish a Climate Action Task Force (CATF). The task force will include OSEC members, community members, city staff, and possibly other commission members. The task force will develop a process to implement and update the climate action plan.

5.5 Public Participation and Community Engagement

Community engagement: Create a citizen implementation subcommittee from OSEC members and possibly add underrepresented portions of the community and youth. Investigate whether students can be given community service hours for participation.

Education and outreach:
Various forms of outreach can be used to educate the public on climate change.

- A sea level rise display at City Hall and/or other community locations can display various impacts of sea level rise over time.
- Flags on Visitacion Avenue can display information about climate change, such as facts or visual representations.
- Letter from Council to residents can convey information about climate change and how important it is to change individual lifestyles.
- Organize the sharing of information at community events by people that have installed energy efficient and renewable energy systems in their homes with interested parties (such as at Day in the Park).
- At public events and on social media, educate people regarding currently available rebates (programs in appendix C).
- Work with the school district on implementing age appropriate climate curriculum in classrooms that are also cross disciplinary: sciences, socio-cultural, etc.[62]
- Organize youth to conduct a community survey to inform/gather opinion about rebates and policies of Brisbane, including composting and energy savings.
- Outreach through Chamber of Commerce regarding the financial benefits of green businesses.
- Videos on city and/or chamber website about businesses that have successfully implemented green business actions/energy savings programs.

Behavior change:
The citizen implementation committee shall study and recommend the most effective methods of outreach to encourage behavior change, including the following examples.

- Education on consumption and how to lower your carbon footprint.
- Support active modes of transportation and travel, such as Bike to Work day.

The City can play a substantial role in generating awareness and educating residents about ways to reduce emissions. While the City can help initiate a movement that emphasizes sustainable practices, it is crucial that other members of the community, such as residents and businesses, are engaged in the process in order to achieve the reduction targets mentioned in

[62] http://www.cooltheearth.org/pages/our-programs/faqs-page

this plan, while minimizing costs. The target will only be achieved by building a movement that achieves sustained action and coordination across all stakeholders and sectors.

As mentioned previously, there are significant opportunities for the City to leverage existing programs funded by the State of California, PG&E, and others to support community efforts to improve energy efficiency, install renewable energy technologies, facilitate transit/biking/walking initiatives, and support households and businesses in taking other actions. The City of Brisbane seeks to distribute information more widely on funding opportunities for residents and local businesses. Actions may include more information posted on the City website and marketing materials posted at key locations, including City Hall and libraries. Additional actions may include partnering with agencies such as PG&E and C/CAG to further develop marketing presentations and workshops for the community.

In efforts to encourage a plant based diet and eating locally, Brisbane can provide vegetarian and vegan options at public events and healthier food options in vending machines. This concept can be further refined as part of or in conjunction with the Climate Friendly Purchasing Guide.

Specific actions that community members can take today are included in Appendix B of this Climate Action Plan. Funding opportunities are listed in Appendix C.

5.6 Timeline

The following timeline lists the major milestones in the climate action plan implementation process. Progress and updates to this schedule should be submitted to City Council and the public as part of an annual Plan Implementation Report.

Table 10. Climate Action Plan Implementation

Milestone	Target Date
2010 GHG Inventory Completed	03/2015
Draft CAP prepared	06/2015
Community Comment Period (OSEC meetings)	06/2015 – 9/2015
Council Review	09/2015
CAP Adoption goal	09/2015
Begin Implementation	10/2015
1st Annual CAP Implementation Report	10/2016
Community Comment Period	10/2016
2015 GHG Inventory Completed	01/2017
1st CAP Update	01/2018

6 Monitoring and Improvement

Monitoring progress is a critical component to ensure that the emissions targets are met. Should monitoring efforts find that the Climate Action Plan is falling short of its goals, the City will add additional voluntary and mandatory measures to the Plan in order to meet the Plan's GHG reduction target. Ongoing monitoring is critical in order to demonstrate that the Plan is achieving its goals, thereby maintaining its status as a GHG Reduction Strategy over time. The implementation and monitoring of the Plan will be critical to the ability of subsequent projects to tier their GHG analysis under CEQA.

The following describes the monitoring and improvement program.

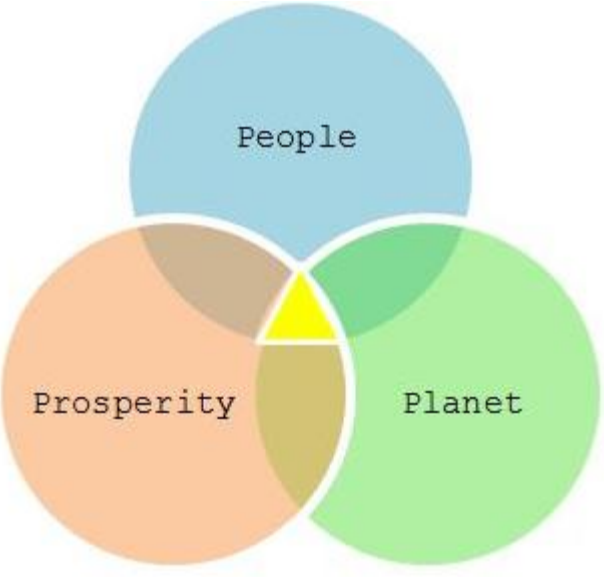
- Every year, staff will prepare an Annual Climate Action Plan Implementation Report (ACAPIR), to update the City Council, residents, and other interested stakeholders as to the progress implementing the Plan measures. The ACAPIR will detail lessons learned and make recommendations for changes to the implementation strategy or the Plan itself. Following the release of the ACAPIR, a 30 day public comment period is suggested to allow for community input on the implementation of the Plan.

- A full GHG inventory will be conducted every 5 years according to the ICLEI Community Emissions Protocol. The inventory will allow the city to understand how emissions levels are tracking in a top-down manner. PG&E can provide updates on electricity and natural gas usage to track associated GHG emissions.

- This Plan may need to be updated based on the results of the GHG inventory. Brisbane may modify and/or add new measures to ensure that the city is on track to meeting its greenhouse gas reduction goals.

7 Conclusion

Climate change is a global problem and only through local solutions designed to meet the needs of our community can we mitigate and adapt to its impacts and protect the environment. While the challenge of climate change is unprecedented, local-level solutions can reduce emissions, increase efficiency, promote ecologically sound economic development, and improve quality of life for residents.



http://sustainablemorristown.org/what-is-sustainability/

The three pillars of sustainability: People, Planet and Prosperity. Sustainability is achieved when there is proper balance between these three pillars.

Sustainability is important to making sure that we have and will continue to have the water, materials, and resources to protect human health and the environment.

Sustainability creates and maintains the conditions under which humans and nature can exist in productive harmony, which permits fulfilling the social, economic and other needs of present and future generations.

Together, we can conserve our scarce resources, thereby saving our families and companies money, increasing the resilience of our economy and emergence of new markets that prioritize green technologies. The City of Brisbane has taken a significant step toward a more sustainable future with this climate action plan. This Plan has identified areas and opportunities to reduce GHG emissions within the community and City operations that, along with statewide efforts, can achieve our environmental goals. The City of Brisbane is poised to reap the benefits of a clean energy economy, with policies that can increase the demand for green jobs.

These are difficult issues. As you can see, when reviewing this Plan, the proposed efforts of Brisbane are small when compared to the collective action of our citizenry. What can a single individual do? Appendix B provides ten ways that individuals can reduce their GHG footprint and help safeguard our environment for future generations.

While an important first step, this plan will remain a living document, to be updated as technology and policies progress, to support the City's efforts to manage GHG emissions for a sustainable future for all.

Appendix A. Glossary of Acronyms and Definitions

AB32	The California Global Warming Solutions Act of 2006
ARB	California Air Resources Board
BAAQMD	Bay Area Air Quality Management District
CAP	climate action plan
CAPPA	Climate and Air Pollution Planning Assistant
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CPUC	California Public Utilities Commission
GHG	greenhouse gas
ICLEI	Local Governments for Sustainability (originally the International Council for Local Environmental Initiatives)
kWh	kilowatt hour
LED	Light emitting diode
MFD	multifamily dwelling
MPO	metropolitan planning organization
MT	metric ton
PACE	property-assessed clean energy
PG&E	Pacific Gas and Electric Company
ppm	parts per million
PV	photovoltaic
RPS	renewable portfolio standard
U.S. EPA	United States Environmental Protection Agency
TOD	Transit-oriented development

Definitions:

GHG emissions: Greenhouse gases are gases that trap heat in the atmosphere when emitted from various sources into the atmosphere. The composition of these gases is Carbon dioxide (CO_2), Methane (CH_4), Nitrous oxide (N_2O), and Fluorinated gases. Each gas varies in the time it stays in the atmosphere before it degrades, and each gas varies in global warming potential.

Green Wall: A wall/vertical element partially or completely covered with vegetation and a growing medium such as soil. Water delivery systems can be incorporated or can be sustained through rain capture.

Lawn Equipment: As included in Community-wide Energy Measure F, gas-powered lawn equipment refers to: lawn mowers, edgers, weed whackers and blowers that are powered by gasoline versus electricity.

Model lighting Ordinance: The International Dark Sky Association and the Illuminating Engineering Society of North America developed a Model Lighting Ordinance. This ordinance was developed to suggest outdoor lighting standards that reduce glare, light trespass and skyglow.

Ordinance: A piece of legislation enacted by a municipal authority.

Organics: As defined by the city's franchise agreement with South San Francisco Scavenger, both food scraps and yard waste.

Recommissioning or retrorecommissioning: The process of validating and documenting the performance of a building and its systems to insure the building function meets the design intent. Recommissioning is the act of commissioning a building again, usually upon change of ownership or after building upgrades.

Windstalks: Are an alternative design to windmills to produce a renewable source of energy.

Appendix B. Ten Steps to Reduce Your Carbon Footprint

Modified from CoolClimate.org

1. Change your commute

Did you know that one third of the CO_2 produced in the U.S. is from the transportation of people or goods? Pick one day a week to walk, bike, take public transportation or carpool to work or when you are running errands. Silicon Valley Bicycle Coalition (http://bikesiliconvalley.org/) has great resources and can help you plan your bike commute. Another resource for planning trips via public transportation is 511.org. If possible, live close to your workplace and talk to your employer about working from home or subsidizing the costs of public transportation. When driving, remember to combine several car trips into one trip and avoid idling. Additionally, you can get better fuel efficiency by following the speed limit. Exceeding the speed limit by just 5 mph during highway travel results in an average fuel economy loss of 6 percent.

2. Be a better consumer

Did you know that the average American generates about 4.4 pounds of trash each day? To reduce the amount of trash you generate, follow these few easy steps. Use re-usable coffee mugs, water bottles and shopping bags. Strategically place your mug and reusable bags in places around your home that is convenient for you to remember them every day. Alternatively, set aside $1 each time you forget your mug or bag; depending on your memory, you will have enough funds to purchase a reusable item sooner or later. Also, reuse as many things as possible and recycle at home, work, and school. Organics pick-up is now available in more parts of San Mateo County. Second, your diet can be more carbon intensive than you think. Meat products require a great amount of resources such as land, water, and feed. “Beef requires the most water, at 1,847 gal./lb., followed by sheep at 1,248 gal./lb. and pork at 718 gal./lb. If you're going to eat meat, go with chicken. Better yet try eggs, which take 395 gal./lb., or plant based protein”. [63] Eating local and a plant based diet whenever possible can significantly reduce your carbon footprint and the impacts on the planet.

3. Shop local

The shorter the distance your food travels to your plate or that product travels to your home, the fewer greenhouse gases are produced. Declare one day a week to be a "buy local day" and eat foods produced within 50 miles of your house. Participate in community-supported agriculture and community-supported fishery programs and shop at farmers markets.

[63] http://www.huffingtonpost.com/2014/10/13/food-water-footprint_n_5952862.html

Buy produce and fish labeled “As Fresh As It Gets,” signifying that it was grown or harvested in San Mateo County. Support restaurants and businesses accredited by the “As Fresh As It Gets” campaign, signifying that they use county-grown produce, fish, and other products. For a list of in-season produce and fish, farmers market locations, and accredited businesses and restaurants, visit www.asfreshasitgets.com.

4. Dry-up Household Water Consumption

Did you know that water-related energy use consumes 19 percent of California's electricity, 30 percent of its natural gas, and 88 billion gallons of diesel fuel every year? To reduce your water consumption at home, turn off your water when it's not being used, take shorter showers, stop unseen leaks by reading your meter, install low-flow shower heads and aerators on your faucet, install and use water-efficient landscaping and irrigation methods (for example, plant drought tolerant plants and/or install permeable surfaces and drip irrigation systems), and use EnergyStar appliances. The Bay-Friendly Gardening Program (http://www.stopwaste.org/) provides resources for selecting plants, conserving water and fostering soil health.

5. Unplug it

Did you know that appliances, chargers, home theater equipment, stereos, and televisions use electricity even when their power is off? Eliminating this "leaking" electricity could save you 6–26 percent on your average monthly electricity bill. Take a walking tour of your home, unplug seldom-used appliances, and install power strips so that the power to frequently used items can be easily turned off.

6. Change the lights

Replace any incandescent light bulbs that remain in your home with Light Emitting Diode bulbs (LEDs). Replacing one incandescent light bulb with a LED can save $30 or more in electricity costs over the bulb‘s lifespan.

7. Set your Thermostat for the Season

Set your thermostat in winter to 68°or less during the daytime, and 62° before going to sleep (or when you are away for the day), to save 5 to 20 percent of your space-heating costs. For an easy fix, purchase an inexpensive programmable thermostat that makes these changes for you.

8. Increase Energy Efficiency at Home

Did you know that you can save up to 350 pounds of CO_2 and $150 per year at home by simply keeping air filters clean? To determine more ways to increase energy efficiency, take advantage of subsidized home energy audits offered through Energy Upgrade California. When you are

ready to purchase an appliance, ensure that you purchase an EnergyStar appliance. To reduce carbon emissions associated with energy use, install or purchase alternative energy for your electricity needs.

9. Stop Unwanted Services

Did you know that junk mail production in the U.S. consumes as much energy as 2.8 million cars? Stop your junk mail at www.directmail.com/junk_mail. Stop unwanted catalogs at www.catalogchoice.org.

10. Get your friends and family to reduce their carbon emissions

Appendix C. Summary of Funding Sources

For implementation of the Climate action plan, Brisbane must evaluate strategies for financing climate protection actions and provide adequate, reliable, and consistent long-term program funding. This appendix provides an overview of available funding sources to help determine appropriate potential program funding sources and funding levels to support existing and new programs outlined in this plan. Other funding sources may be available that are not listed here.

C.1 Federal Funding

Federal Transportation Investment Generating Economic Recovery (TIGER) Grant
The Federal Transportation Investment Generating Economic Recovery (TIGER) grant program was created by the American Investment and Recovery Act (ARRA) of 2009. Each project is multi-modal, multi-jurisdictional or otherwise challenging to fund through existing programs. The TIGER program enables the US Department of Transportation to use a rigorous process to select projects with exceptional benefits, explore ways to deliver projects faster and save on construction costs, and make investments in our nation's infrastructure that make communities more livable and sustainable. - See more at:
http://www.transportation.gov/tiger/about#sthash.ZNPcXDNx.dpuf

C.2 State Funding

California Energy Commission Energy Efficiency Financing
http://www.energy.ca.gov/efficiency/financing/index.html

Municipal projects may be eligible for funding through the CEC, which offers loans with one percent interest to finance energy efficiency improvements.

Energy Upgrade California
http://www.energyupgradeca.org/en/

The Energy Upgrade California program helps residential and commercial consumers and the building industry to access available rebate programs and financing options for energy efficiency and renewable energy projects. The program is a partnership among California counties, cities, non-profit organizations and the state's investor-owned utilities (Pacific Gas & Electric, Southern California Edison, Southern California Gas Company and San Diego Gas & Electric Company), and publicly owned utilities. This effort is supported by an alliance of the California Public Utilities Commission, the California Energy Commission, utilities, regional energy networks, local governments, businesses, and nonprofits to help communities meet state and local energy and climate action goals. Funding comes from investor-owned utility customers under the auspices of the California Public Utilities Commission.

C.3 Utility Rebate Programs

Pacific Gas and Electric (PG&E) offers a full suite of energy efficiency rebates programs to support its customers in saving energy and money.

- Rebates for households: http://www.pge.com/myhome/saveenergymoney/
- Rebates for businesses: http://www.pge.com/mybusiness/energysavingsrebates/

Below, we provide some specific examples of PG&E programs available to the community.

PG&E San Mateo County Energy Watch Program
http://www.smcenergywatch.com

San Mateo County Energy Watch provides energy efficiency services and retrofits and assists businesses and moderately low-income households to identify cost-effective projects. The program's services include energy audits, special rebates and incentives

PG&E Residential Appliance Rebates
http://www.pge.com/en/myhome/saveenergymoney/rebates/index.page

PG&E offers rebates to customers who purchase qualifying energy efficient appliances, including dishwashers, hot-water heaters, and room air conditioners. Rebates range from $30 to $75 for qualifying appliances. PG&E and the City of Brisbane, through BAWSCA (the Bay Area Water Supply and Conservation Agency), are also currently offering a combined rebate of up to $150 for installing high-efficiency clothes washers. Rebates and incentives are also available for lighting, roofing, flooring, HVAC ducting and central air conditioning.

PG&E LED Streetlight Replacement Program
http://www.pge.com/mybusiness/energysavingsrebates/rebatesincentives/ref/lighting/lightemittingdiodes/incentives/index.shtml

The City of Brisbane may be eligible for PG&E's LED streetlight replacement program for their remaining streetlights that have not yet been converted to LEDs, which provides rebates to cities that replace existing streetlights with more energy efficient LED fixtures (up to $125 per fixture).

PG&E Commercial Appliance Rebates
http://www.pge.com/en/mybusiness/save/index.page

PG&E offers rebates to business customers on hundreds of products including refrigeration units, lighting fixtures, heating systems, food service appliances, boilers and water heaters, and insulation.

PG&E Home Energy Efficiency Improvements Rebates
http://www.pge.com/myhome/saveenergymoney/rebates/remodeling/

PG&E offers rebates to customers who make energy efficiency improvements when remodeling their homes. Currently PG&E offers a Home Upgrade rebate of up to $3,000 to homeowners who take a whole-home approach to energy efficiency instead of focusing on individual improvements. Improvements are focused on the building shell to maintain a warmer or cooler indoor environment. Improvements may include attic, wall and floor insulation, duct sealing, furnace and AC replacements, and more. The Advanced Home Upgrade option offers up to $6,500 in rebates, goes beyond building shell upgrades, and is typically more complex, involving further level of improvements.

C.4 Local Energy Programs

Right Lights Program
http://rightlights.org/

The Right Lights Program provides subsidized energy efficiency upgrades of lighting, with free professional assistance to help businesses lower energy bills and boost cash flow. Generally any commercial PG&E customer who receives electric service on the A1, A6, A10, or E19-v rate schedules is eligible for the program. Property owners as well as businesses who lease their space are encouraged to apply. Multi-family residential properties are eligible for Right Lights in their common-use areas only.

C.5 Other Programs and Grants

American Forests Global ReLeaf Grant Program
http://www.americanforests.org/global_releaf/

American Forests is a non-profit organization founded in 1875 that promotes forest conservation. American Forest's Global ReLeaf Program provides grants to fund tree-planting projects in urban and natural areas.

California ReLeaf Urban Forestry Grant Program
http://californiareleaf.org/programs/grants

The California ReLeaf Urban Forestry grant program provides funding to assist nonprofit and community-based groups throughout California with urban forestry projects. The program is funded through a contract with the California Department of Forestry and Fire Protection (CAL FIRE), Region IX of the Environmental Protection Agency and the USDA Forest Service.

Large Landscape Audit
http://bawsca.org/

BAWSCA and its participating member agencies, including the City of Brisbane, offer this audit program to select large landscape area owners or managers within the service area, free of charge. This program includes the development and monthly distribution of landscape water budgets for selected accounts and actual large landscape surveys to assess landscape watering needs. A key component of the program is ongoing monitoring/tracking of actual water use and estimated water savings for the sites surveyed.

Waste Assessments by South San Francisco Scavenger
http://www.ssfscavenger.com/index.html
South San Francisco Scavenger Company offers consultations, waste assessments, staff training and recycling and compost flyers in several languages to their business customers.

Appendix D. Adaptation Planning for Climate Impacts

Effective adaptation planning and management entails dealing with uncertainty. It is a long-term process that should allow immediate action when necessary and adjust to changing conditions and new knowledge. Brisbane plans to initiate an inclusive planning process that ensures the resulting actions are feasible and widely accepted. Adaptation will likely be an ongoing process of planning, prioritization and specific project implementation.

Five important steps to effective adaptation planning are summarized below:

1. **Increase Public Awareness; Engage and Educate the Community**

   It is critical that the public understand the magnitude of the challenge and why action is needed. The planning process should be inclusive of all stakeholders. Local outreach campaigns are needed to promote awareness of the dangers of heat exposure and recommend low-cost and low-GHG adaptation strategies. These efforts should leverage similar efforts undertaken at the regional, state, and federal levels.

2. **Assess Vulnerability**

   Understanding vulnerability to sea level rise and other climate change impacts is critical to developing adaptation effective strategies. A detailed vulnerability analysis should be performed to assess potential climate change impacts to infrastructure and natural systems. Future vulnerability of assets and infrastructure can then be assessed using conceptual models of shore response to sea level rise. Shore response models can be applied for one or more climate change scenarios and planning horizons, and a strategy for adapting can be developed with due consideration to priorities and time frames. Both short-term and long-term adaptation strategies should be identified. Level of risk can be categorized in terms of likelihood of damage within the forecasting period and the severity of the damages. This allows planners to prioritize their response to sea level rise. The vulnerability assessment can also provide a framework for agency and community education and participation, feed into other planning documents, and identify funding needs.

3. **Establish Goals, Criteria and Planning Principles**

   Engage with stakeholders to establish planning priorities, determine decision criteria, and build community support for taking action. Rank physical and natural assets for preservation efforts. Where possible, look for situations where a mitigation action has adaptation co-benefits (e.g., planting trees to reduce urban heat islands while sequestering carbon and providing habitat).

4. **Develop Adaptation Plan**

   Identify specific strategies, develop actions and cost estimates, and prioritize actions to increase local resilience of City infrastructure and critical assets, including natural systems like wetlands and urban forests. Look for synergies between natural processes and engineering solutions. There is a continuum of strategies available to manage sea level rise, ranging from coastal armoring (levees, seawalls, etc.) to elevated development to a managed retreat or abandonment of low-lying development. An

adaptation plan should include a prioritized list of actions (e.g. projects) with a timeline, capital expenditure plan, and framework for monitoring and adaptive management.

5. **Ongoing Monitoring and Adaptive Management**

   Reassess climate change vulnerabilities on a regular basis and modify actions accordingly. This includes monitoring the effectiveness of current policies, strategies and actions, and keeping up with changing science, funding opportunities, and regulatory actions.

A menu of potential adaptation strategies and measures is provided in the table below.

Table 7. Adaptation Strategies and Measures

Climate Change Impacts	Sample Adaptation Measures
Sea Level Rise Risks to existing facilities, natural systems, private property and public infrastructure	• Educate and engage the community on the need for long-range planning • Partner or collaborate with other jurisdictions and agencies to increase awareness and build community support for action • Identify funding mechanisms and seek public-private partnerships where interests converge • Use natural backshore wave-buffering processes to reduce wave erosion • Increase or maintain the buffering capacity of tidal wetlands to protect against storm surges and keep pace with sea-level rise • Protect and restore wetlands that provide vital habitat and carbon storage, and allow for landward migration of habitat over time • Make modifications to low-lying wastewater facilities. Consider opportunities for integrating wastewater treatments and wetlands • Avoid new development in areas at risk based on sea level projections • Do coastal armoring with seawalls to protect vital infrastructure from erosion, inundation, and flooding
Extreme Heat Events Risks to public health and infrastructure	• Identify vulnerable communities and develop emergency preparedness plan • Establish cooling centers, especially for vulnerable populations • Reduce urban heat islands through use of cool roofs and other reflective surfaces • Do targeted tree planting and enact new requirements for shading in new parking lots and other large paved areas • Reduce risk of wildfires through fuels reduction in the urban-wild land interface
Regional Drought Risks to reliable water supply, and potential conflicts between urban and	• Increase capacity for community water storage • Promote local water conservation • Make water conservation a top priority for agriculture in the region • Do water reclamation and reuse projects

agriculture users	
Increased Flooding and Severe Weather Events Risks to public health, private property, public infrastructure, and ecosystems	• Integrate local flood management plans with adaptation planning • Identify vulnerable communities and develop emergency preparedness plans • Establish local land use policies that decrease flood risk; avoid building in high-risk areas • Make modifications to storm water system routing and storage. Develop storage areas for peak flows • Maximize use of bioswales and permeable surfaces in both greenscape and hardscape areas to improve aquifer recharge and mitigate flooding from stormwater
Air Quality and Other Public Health Concerns	• Restrict use of fireplaces and open fires on high-risk days • Monitor potential threats to public health, including new diseases, and develop public awareness
Threats to Species, Ecosystems, and Ecosystem Services	• Design urban forest program to improve biodiversity, provide heat relief, and sequester carbon • Preserve wetlands, salt marshes, and other critical coastal habitats
Risks to Local Agriculture and Food Supply	• Promote the use of public and private land and rooftops for producing food • Promote the planting of fruit and nut trees; consider street trees • Support local farmers markets by providing incentives such as reduced costs for permits and support in attaining electronic benefit transfer (EBT) point-of-sale terminals • Provide incentives and remove regulatory obstacles to encourage animal husbandry and local food production and distribution • Provide and promote educational opportunities for residents at all levels of the educational system (preschool through college) to gain skills in organic gardening; fruit production; animal husbandry; food preservation and cooking; and affordable, healthy eating • Develop a city-run or city-supported food gleaning program that organizes volunteers or compensates workers to collect food from trees and shrubs on land owned by cities or within cities to distribute through food banks and other local distribution channels • Reduce food waste by implementing a local composting where all food scraps, food-soiled paper, waxed cardboard, wood crates and landscape trimmings from markets, restaurants, homes, hotels, and schools, would be collected and made available for distribution to rural or urban gardeners

Appendix E. Future Opportunities for Emissions Reductions

Additional measures that the city may implement are in the following sections of this document: Measures requiring future study and Public Participation and Community engagement: Actively create partnerships with the county to reach these goals.

Appendix F. Baseline GHG Inventory and Forecast

The data table below was taken from the Brisbane 2010 Community Inventory report. In the table the baseline data for 2005 is displayed. The GHG emission data was gathered using the ICLEI common protocol for determining in-boundary GHG emissions from transportation. The in-boundary method takes into account vehicles that stop in Brisbane and not those that pass by on state highways or drive through.

For a GHG emission forecast refer to Section 2.2.5 Emissions and Forecast for 2020 and 2035

Table 4: 2010 Community Emissions by Sector

Sectors Included in the Baseline Inventory	2005 GHG Emissions (metric tons CO_2e)	2010 GHG Emissions (metric tons CO_2e)	Increase or Decrease in GHG Emissions (metric tons CO_2e)	Percentage of 2010 GHG Emissions
Residential	5,711	5,847	+136	4.0%
Commercial/Industrial	23,588	19,976	-3,612	13.5%
Transportation – Local roads	21,463	21,076	-387	14.2%
Transportation – State highways	95,352	82,113	-13,239	55.5%
Transportation – Off-road equipment	6,287	6,635	+348	4.5%
Solid Waste – Landfills	4,212	6,111	+1,899	4.1%
Solid Waste – Generated Waste	1,483	1,084	-399	0.7%
SUBTOTAL	**158,096**	**142,843**	**-15,291**	**96.5%**
New Sectors (not included in the Baseline Inventory)	**2005 GHG Emissions (metric tons CO_2e)**	**2010 GHG Emissions (metric tons CO_2e)**	**Increase or Decrease in GHG Emissions (metric tons CO_2e)**	**Percentage of 2010 GHG Emissions**
Stationary Sources	Not available	2,449	Not applicable	1.7%
Transportation – CalTrain		2,280		1.5%
Transportation – Freight Trains		301		0.2%
Wastewater		72		0.0%
Water		82		0.1%
SUBTOTAL		**5,183**		**3.5%**
Total of 2010 Emissions*		**142,843**	**metric tons CO2e**	
Total of 2005 Baseline Emissions**		**158,096**	**metric tons CO2e**	
Total Decrease		**-15,253 -10%**	**metric tons CO2e**	

* Total 2010 emissions only include sectors and sources that were included in the original 2005 baseline inventory. As shown in Table 1, new sectors and sources accounted for an additional 5,183 MT CO_2e. These new sectors and sources were not included when making comparisons between 2005 baseline and 2010 emissions levels.

**Total 2005 baseline emissions exclude previously-reported Direct Access natural gas. The Direct Access natural gas consumption was erroneously double-counted in the baseline 2005 inventory.

Appendix G. Emission Reduction Measures: Calculations

City of Brisbane: List of Climate Action Plan Measures and GHG Savings

Table 1. Energy Measures

Code	Measure Name	Detailed Description	Assumptions	GHG Emissions Savings by 2020 (MTCO2e)
Community-wide measures				
EC1	Commercial green building ordinance	The City has implemented a Commercial Green Building Ordinance which requires new commercial construction over 10,000 square feet to achieve a LEED Silver rating on the Green Building Project Checklist	Ordinance applies to 15% of new commercial construction by 2020 and results in 15% energy savings.	**4**
EC2	Residential green building ordinance	The City implemented a Residential Green Building Ordinance that requires new single family dwellings in developments with over 20 housing units to achieve a "green home" rating on the New Home Green Points Checklist.	Ordinance applies to 20% of new residential construction by 2020 and results in 5% energy savings.	**8**
EC4	Participate in Energy Upgrade Program and similar residential rebate/incentive programs as they become available and promote existing rebates (PG&E, State, Federal)	City will encourage residential energy audits and the implementation of recommendations identified by audits and promote existing energy efficiency financing options. The City will encourage the use of window curtains and reduced exterior lighting at night. The City will also. provide a DIY Energy Toolkit through the library. The City will also promote existing solar hot water rebates/tax credits and comply with AB 2188 by the deadline to streamline solar permitting.	45 homes upgraded by 2020 and achieving average 20% energy savings.	**72**

Code	Measure Name	Detailed Description	Assumptions	GHG Emissions Savings by 2020 (MTCO2e)
EC5	Promote PG&E commercial and industrial energy efficiency/demand response programs	City will encourage commercial energy audits and the implementation of recommendations identified by audits and promote existing energy efficiency financing options, encourage. The City will encourage reduced commercial exterior lighting at night. The City will encourage planting of trees in commercial parking lots. The City will also comply with the state's Nonresidential Building Use Disclosure Program. The City will also promote existing solar hot water rebates/tax credits and comply with AB 2188 by the deadline to streamline solar permitting.	20% of non-residential properties upgraded by 2020 and achieving 20% energy savings.	**541**
EC9	Voluntary Residential Energy Disclosure	Voluntary disclosure of energy use information at time of home sale	55.2 homes and condos sold per year with 30% of sold homes/condos participating in program with a resulting 10% energy savings for homes/condos that participate.	**42**
EC10	Community Choice Aggregation (CCA)	The City will continue to participate in and support the feasibility study of a Community Choice Aggregation (CCA) Program. Enabled by California legislation (AB117), Community Choice Aggregation (CCA) allows local governments to purchase and generate power to sell to residential and business customers. Energy transmission, distribution, repair and customer service remain the responsibility of PG&E.	50% of customers purchasing 50% renewable energy option and 1% of customers purchasing 100% renewable energy option by 2020.	**1,407**
EC11	Ban gas powered lawn equipment	Gas powered lawn equipment would be phased out and replaced with electric powered lawn equipment when feasible. Encourage purchase of electric powered	Baseline gas-powered lawn and garden equipment annual emissions pulled from Brisbane's 2010 community inventory (85	**43**

Code	Measure Name	Detailed Description	Assumptions	GHG Emissions Savings by 2020 (MTCO2e)
		lawn equipment over gas powered. Potentially adopt an ordinance to ban gas powered lawn equipment. Potentially phased in by commercial first then residential.	MT CO2e). Assumes conversion of all lawn and garden equipment to electric equipment.	
Municipal measures				
EM1	Energy efficient street lighting	The City will continue to replace existing street lights with LEDs.	Historic rate of replacing high pressure sodium and incandescent bulbs continues.	**32**
EM2	Environmentally preferred purchasing policy - Energy	That City will adopt an Environmental Procurement Policy that emphasizes recycled materials and ENERGY STAR equipment.	15% of devices replaced with ENERGY STAR devices by 2020	**4**
EM4	Renewable energy installation on municipal property.	The City will pursue for solar PV on City hall and investigate the potential at other facilities.	Solar on all municipal buildings	**65**
EM5	Energy efficiency in municipal buildings	The City will continue to audit city facilities for energy efficiency opportunities and implement energy efficient retrofits. City participates in San Mateo County Energy Watch and leveraged benchmarking to identify opportunities for EE upgrades and track energy performance. Leverage other programs that provide funding.	Historic rate of auditing/upgrading municipal buildings.	**13**
EM7	Enroll in offset program	The City will purchase 100% renewable energy from the future CCE or enroll in an energy offset program to offset city GHG emissions	100% renewable CCE electricity or offset 50% of emissions from electricity and gas purchases by 2020.	**207**

Code	Measure Name	Detailed Description	Assumptions	GHG Emissions Savings by 2020 (MTCO2e)
		from electricity and natural gas.		

Table 2. Sustainable streets/ transportation measures

Code	Measure Name	Detailed Description	Assumptions	GHG Savings by 2020
Community-wide measures				
TL5	Public EV Charging	The City will install public EV charging stations. The City will explore how to incentivize businesses to install solar PV.	Not quantified.	**N/A, Supporting Measure**
Municipal measures				
TM4	Adoption of low emission government vehicles	Target purchase of new or conversion of existing government vehicles to more efficient vehicles.	Replace 4 public works vehicles with alternative fuel vehicles by 2020	**14**

Table 3. Solid Waste Measures

Code	Measure Name	Detailed Description	Assumptions	GHG Savings by 2020
Community-wide measures				
WC1	Set higher diversion rate goal.	The City will promote residential waste reduction and continue offering food scrap pickup through Waste Management. Additionally, the City will encourage community exchange of used items.	Raise diversion rate from 75% to 85%	**605**
WC2	Commercial recycling ordinance	The City will continue to support required commercial recycling and City staff/waste management staff will verify compliance.	Supporting measure, not quantified	**Supporting measure**
WC3	Create Sustainable Vendor Policy for public events	The City will encourage residents to bring reusable plates, etc. to public events and require a waste attendant at public events to promote recycling and	Supporting measure, not quantified	**Supporting measure**

		composting.		
WC4	Yard waste ordinance	The City will adopt an ordinance requiring that all landscapers and landscape maintenance businesses recycle/divert yard waste. Provide residents and businesses with food scraps collection. Explore a ban on these organics from landfill.	Supporting measure, not quantified	**Supporting measure**
Municipal measures				
WM1	Environmentally preferred purchasing policy - Waste Reduction	Implement a sustainable purchasing policy that emphasizes recycled materials	Supporting measure, not quantified	**Supporting measure**
WM2	Establish a zero waste policy	Government policy to achieve 95% diversion by 2020.	Increase municipal diversion rate from 75% to 95% by 2020	**10**

Table 4. Water Measures

Code	Measure Name	Detailed Description	Assumptions	GHG Savings by 2020
EW1	Water conservation incentives	The City adopted the Brisbane Indoor Water Conservation and water Conservation in Landscaping Ordinances in 2010 and will continue to apply the ordinances. The city will continue to promote existing and/or new rebates for water efficient appliances and fixtures through BAWSCA and promote CaliforniaFIRST water efficiency project financing for drip irrigation and artificial turf. The City will promote information/programs for water efficient landscaping and consider providing incentives for drought-resistant plants. The city has promoted use of rain barrels (http://www.brisbaneca.org/news/2015-04-06/rebates-rain-barrels)	20% of households achieve 10% water savings	**24**

Table 5. All Sector Measures

Code	Measure Name	Detailed Description	Assumptions	GHG Savings by 2020
A1	Participate in County Green Business program	Promote San Mateo County Green Business program and set goals for participation. (Voluntary program that allows businesses to brand themselves as green by following sustainable practices.	20% of businesses participating in Green Business Program by 2020	**81**

Appendix H: Environmentally Preferred Purchasing Policy/Guide

Climate Friendly Purchasing Guide for City of Brisbane

Definition

Climate friendly purchasing (CFP) means the purchase of products and services that have a decreased negative impact on human health and the environment when compared to alternative products and services. This policy is designed so City employees will purchase materials, products, or services which are fiscally responsible, and have the least impact on the environment.

Purpose

The goal is for the City of Brisbane to use its purchasing power influence to offer goods and services with better environmental performance, and to procure products and services from manufacturers and suppliers that demonstrate a high level of environmental and social responsibility. The City intends to reduce impacts to human health and the environment, reduce greenhouse gas emissions, remove unnecessary hazards, and improve to the overall environmental quality of the region. This guide will direct the City's efforts in purchasing environmentally preferred and/or sustainable products and services.

This guide is intended to:

- Identify those sustainability factors that will be considered when making purchasing decisions.
- Provide implementation and purchasing guidance.
- Empower City of Brisbane employees to be leaders in environmental stewardship.
- Communicate the City's continued commitment to long-term sustainability efforts.

Implementation and Compliance

When purchasing or using products/services the City employee will follow these steps:

1. Use products and/or services that are certified with an Eco-label. If a certification label is not on the approved list (as seen below) the employee will look to step two of the process.

When looking for an Eco-Label certification, it is important to use independent third party social/environmental service label standards. Labels should be developed and awarded by an impartial third-party that was produced in a transparent process.

This guide recognizes that eco-friendly products may come with a higher up front cost when compared to competing products. The City gives permission to the employee purchasing said item or service to choose the more eco-friendly item. Products that are durable, long lasting, reusable, or create less waste shall be selected whenever possible. It is also worth mentioning that when purchasing an eco-friendly product, although the initial cost may be higher, the product will likely offset higher longer term costs that the City may incur. Considering the life cycle of a product over the initial cost of a product is crucial. Since there is a growing market for eco-friendly products, employees may have the opportunity to consider the most cost effective product between two eco-friendly options.
The following list provides a list of example products and the various eco-label certifications to look for. This is not a comprehensive list, as there are many eco-friendly labels out there. Make sure to reference the above statement about identifying a legitimate eco-label.

Product Category/Service	Example Products	Eco-Label
Paper	Copy paper, colored copy paper, cardstock, business cards, post-its, file and hanging folders, dividers, brochures, newsletters, mail inserts, envelopes, shipping and mailing labels, note pads, custodial paper products.	*These must contain a minimum of 30% post-consumer recycled content*
Office Supplies	Binders, sheet protectors, pencils, pens, white-out, paper clips, scissors, ink and toner cartridges (use non-toxic inks)	
Office Furniture and Indoor/Outdoor Fixtures	Desks, chairs, high efficiency toilets and water saving fixtures, carpet, plastic lumber. For products that use wood, give	

	preference to products that are certified to be sustainably harvested.	
Cleaning Products and Paint	Green cleaning and maintenance products, low-toxicity paint, and other products that are low in volatile organic compounds (VOCs) and/or carcinogens	
Vehicles	Hybrids, low emission vehicles, alternative fuel vehicles (AFV), electric vehicles	
Electronics	Purchase all new computers and monitors so that they are EPEAT certified. Replace desktop printers, copiers, fax machines, and scanners with multifunction devices. Recyclable and rechargeable batteries shall be purchased and used whenever possible.*	
Appliances	Purchase all new appliances (microwaves, fridge, stove, and toaster oven) so that they are energy star efficient.	
Kitchen Supplies	Cups, plates, cutlery, and coffee filters that are made of recycled or biodegradable materials/	

	environmentally friendly. In the future, consider purchasing a dishwasher for the City kitchen to be used with eco-friendly dish washer detergent. In the future, establish a compost bin for City Hall.	
Electricity/ Energy	It is the intention of the City to further investigate and consider moving to using solar-powered energy/ renewable energy sources for City buildings and facilities. Buildings have lighting controls, timers and/or motion sensors.	

*Use auto-shut off or sleep mode on computers and monitors if available.

2. If there is no eco-label or “eco-friendly” alternative product the employee will consider qualities such as; durability, product life, life-cycle assessment, environmental health/ benefit of the product, maintenance costs, and ultimately the disposal of the product when compared to competing products that do not offer these more environmentally friendly benefits. While not all of these factors can be considered in every purchase, it is intended that City employees will make a concerted effort to incorporate and balance these factors to the maximum extent possible.

Environmental factors to be considered, but are not limited to, include:

- Toxicity
- Waste generation
- GHG emissions
- Energy consumption of the product and in the production of the product
- Depletion of natural resources
- Impacts on biodiversity

Other factors to consider in the office:

- Reduce transportation impacts when ordering goods. Avoid overnight shipping whenever possible, give preference to local manufactures and distributors, and ask vendors to offer incentives for reducing the frequency of deliveries.

- Do not use unsustainable packaging, encourage vendors to use reusable/ recyclable packaging, buy long lasting products, and consolidate orders.

- Only print when absolutely necessary, use duplex setting when printing (if offered on the printer), and identify "printed on recycled paper" when printing and "think before you print" on staff e-mails. Further develop a practice of reducing as much paper as possible (email when possible and only print documents upon request).

- The "Everything for the Workplace" office supply catalog (that is supplied by the distributor we contract with to purchase office goods) helps to highlight which products are recycled and environmentally friendly. Also look at the SF Approved List website http://www.sfapproved.org/ when searching for new goods.

- Recycle and repurpose items whenever possible. Items can include; cars, furniture, computers, electronics, etc.

- Regarding the Brisbane Community Pool and other City facilities: Consistently monitor energy efficiency and regularly re-train staff on energy saving practices at said sites. Re-asses the efficiency of City facilities frequently (frequency to be determined).

- It is worth mentioning that the City of Brisbane is committed to water reduction and conservation. City staff is committed to limiting water usage at City facilities with efforts such as limiting outdoor landscaping watering, and fixing leaking water fixtures. The City shall continue to reduce water usage and improve water efficiency, and to educate and encourage the residents of Brisbane to do the same.

Monitoring and Training

Staff and/or an appropriate advisory committee will be tasked with implementing the City's Climate Action Plan, when adopted, and will also assist in implementation of the Climate Friendly Purchasing guide for the City. They will focus on tasks such as:

1) Formulate a plan for implementation.
2) Educate city staff about the new guide, and help facilitate the use of the guide.
3) Review the policy bi-annually to present any recommendations to the City Manager or City Council to be more effective and efficient and further build on the guide.
4) Organize the pilot testing of environmentally preferable/sustainable products for office use.
5) Ensure that internal policies and procedures reference this guide and make an effort to incorporate the use of sustainable products and services accordingly.

6) Encourage employees to attend sustainability related trainings, in or outside of the office.

7) Identify instances (and frequencies) where the policy is waived and there are barriers to purchasing eco-friendly products and try to seek alternatives for the future.

8) Monitor the actual behavior and implementation of the guide. Figure out how to quantify improvements and behavior/practices.

The City shall commit to providing the appropriate staff and funding needed to support the implementation of this guide. This could include activities such as employee trainings, product/service pilot tests, and providing educational materials.

Sources

1. "Environmental Procurement Policy." *Environmental Procurement Policy*. San Mateo County, 2000. Web. 19 Aug. 2015.
2. "EPEAT Gold Computers, Monitors, Tablets." *SF Approved*. Web. 19 Aug. 2015.
3. "Product Resources Guides | Comprehensive Procurement Guidelines (CPG)." *EPA*. Environmental Protection Agency. Web. 19 Aug. 2015.
4. "Sample Climate-Friendly Purchasing Guide." *Sustainability/Climate Change*. Institution for Local Governments. Web. 19 Aug. 2015.
5. "Buy Green." *Buy Green*. CoolCalifornia. Web. 19 Aug. 2015.
6. "Environmentally Friendly Procurement." *Environment*. City of San Jose. Web. 19 Aug. 2015
7. "Green 101: Overview." *Responsible Purchasing Network*. Responsible Purchasing Network. Web. 19 Aug. 2015.
8. "Environmentally Preferable Purchasing Policy." City of Berkeley, 2004. Print.
9. "Sustainable Purchasing Fact Sheet." *Environmental Health San Mateo County*. San Mateo County. Web. 19 Aug. 2015.
10. Espinoza, Tyler, Chris Geiger, and Iryna Everson. "The Real Costs of Institutional “Green” Cleaning. “*Http://www.greenbusinessca.org/media/article_uploads/the_real_costs_of_green_cleaning_v6.pdf*. Green Businesses CA. Web. 19 Aug. 2015.